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ABSTRACT

Of all the areas within public elementary and secondary education that are experiencing rapid change, none is experiencing more turmoil than school finance. This publication contains papers commissioned by the National Center for Education Statistics (NCES) to address the twin concerns of what additional school-finance information NCES should collect and report, and how extant data might be analyzed to address interesting questions faced by the school-finance profession. Following the introduction and overview by William J. Fowler, Jr., the first three papers present three perspectives on what the nation's data needs are in the area of school finance. Specifically, the papers examine whether recent changes to the NCES financial collection satisfied the data needs of educational policymakers and the school-finance research community. They include: (1) "Recommendations to the National Center for Education Statistics to Improve Its Role Regarding School Finance Data: The Perspective of State Policymakers" (John Augenblick); (2) "Issues and Data Needs in School Finance" (Susan H. Fuhrman); and (3) "A Call for Multiple Intrastate Studies" (William W. Cooley). The remaining three papers concern emerging school-finance topics that pose statistical and measurement problems for NCES: (4) "Estimating the Costs of an Educational Voucher System" (Henry M. Levin and Cyrus E. Driver); (5) "Intrastate Cost Adjustments" (Walter W. McMahon); and (6) "Costs of Measuring and Providing Opportunity to Learn: Preliminary Thoughts" (Allan Odden). Most papers contain references. (LMI)

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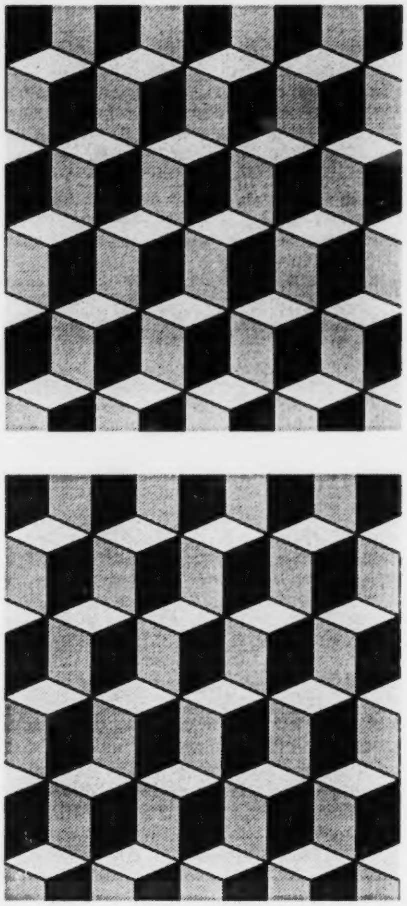

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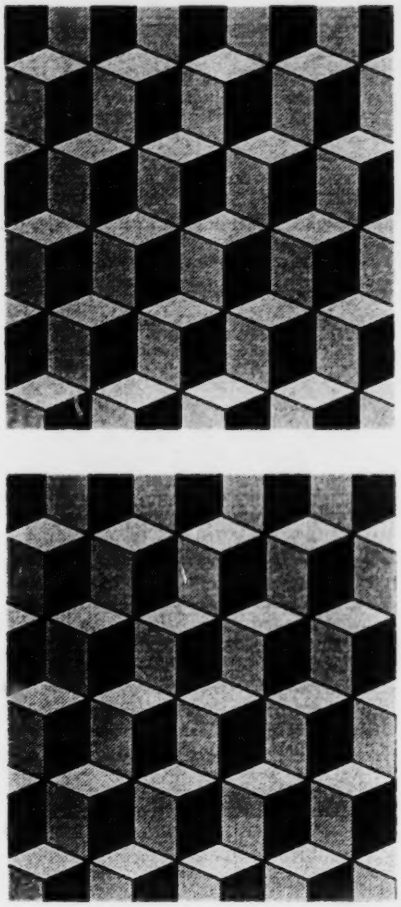

William J. Fowler, Jr., Editor

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Dedication

To the memory of Esther O. Tron

This publication is dedicated to Esther O. Tron, who first began ***Selected Papers in School Finance*** in 1974. The current editor wishes to express his appreciation of Esther's efforts to publish that first set of volumes, which he found invaluable in assisting him in becoming knowledgeable in the field of school finance. Although he did not have the pleasure of knowing Esther personally, those who did remember someone who was warm and engaging, persistent and dedicated, and well respected by her colleagues. Our debt to her, and our memory of her, will live as long as research in school finance endures.

Foreword

Paul D. Planchon, Associate Commissioner

Elementary and Secondary Education Division

The National Center for Education Statistics constantly reevaluates its efforts in the field of school finance by commissioning papers from distinguished members of the school finance research community, asking them to assess the data needs of the profession. Even when these data needs have been satisfied, a number of difficult statistical and measurement questions arise when conducting empirical and quantitative research. The papers presented here were commissioned by NCES to address the twin concerns of what additional school finance information NCES should collect and report, and how extant data might be analyzed to address interesting questions faced by the profession.

This report is the first in this series since 1977, when NCES discontinued the publication. The papers are intended to promote the exchange of ideas among researchers and policymakers. Because the views are those of the authors, the papers may provoke discussions, replications, replies and refutations. If so, the publication will have accomplished its task. There would be nothing so satisfying to the Center as promoting and contributing to the field of school finance.

Acknowledgments

The editor wishes to gratefully acknowledge the comments and suggestions of the reviewers: Lee M. Hoffman and Michael P. Cohen of the National Center for Education Statistics (NCES). I also wish to acknowledge the contributions of Valerie Martin, Carol Rohr, Tony Russo, Mia Perona, and Rebecca Pratt of Pinkerton Computer Consultants, who incorporated the text and graphics into a published document.

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Introduction and Overview

About the Author

Dr. William J. Fowler, Jr. is an education statistician at the U.S. Department of Education National Center for Education Statistics (NCES), who specializes in school finance and educational productivity research. His work has centered on redesigning the federal school finance data collection to obtain information that can provide more policy-oriented analyses for the school finance community. NCES has reinstituted a state and school district finance data collection for the first time in more than a decade, and is currently funding exploratory research work.

Prior to his work at NCES, Dr. Fowler served as a supervisor of school finance research for the New Jersey Department of Education, taught at Bucknell University, and at the University of Illinois. He also served as a senior research associate for the Central Educational Midwestern Regional Educational Laboratory (CEMREL) in Chicago, and for the New York Department of Education.

Dr. Fowler has been a member of the American Education Finance Association since 1977, and was elected to its Board of Directors in 1992. He is a coauthor of *Disparities in Public School Spending*, 1989-90, and a coeditor of *Organizational Influences on Educational Productivity*, published by the JAI Press, and serves on the editorial board of the *Journal of Education Finance*. He obtained his doctorate in education from Columbia University in 1977.

Selected
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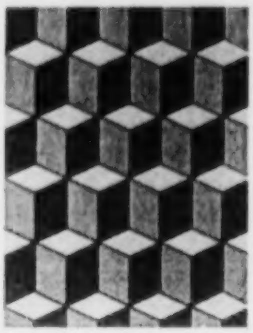

Introduction and Overview

Introduction and Overview

William J. Fowler, Jr.
National Center for Education Statistics

The National Center for Education Statistics (NCES) sought the papers in this publication to address two pressing issues. One revolved about the nation's school finance information requirements. NCES sought to find out whether recent changes to the NCES financial collection satisfied the data needs of education policymakers and the school finance research community. The second issue concerned emerging school finance topics that pose statistical and measurement problems. These problems pose unknown costs for NCES that may preclude the collection of relevant data. Under this rubric, there is an increasing call for finance data in public school choice and opportunity to learn, but no one knows the cost of getting this information. Similarly, new data provided by NCES permit more accurate assessments in the geographic cost of living between school districts. However, devising such measures are always technically difficult tasks, and subject to criticism, whatever the methodology employed. To address these pressing issues, NCES turned to highly regarded school finance researchers. NCES requested that they apply their considerable talents toward examining these issues. This publication captures their thoughts in publishable form.

Current work

The first three papers, then, present three perspectives on what the nation's data needs are in school finance. NCES asked the authors to comment in light of the changes in the NCES finance program described above. The first paper, by **John Augenblick** of Augenblick, Van de Water and Myers (AVM), considers the perspective of data users. Augenblick makes recommendations about NCES' role in providing useful school finance data to the policy community. Augenblick conducts interviews with members of the school finance policy community, and bases his recommendations not only on his own experience, but also upon the conversations he conducted.

For many policymakers, school finance is a matter of states allocating aid to school districts. Policymakers also legislate controls on taxing and spending behavior of school districts. This has led to a focus on "equity," "adequacy" and "efficiency," and on technical issues, such as how to count compensatory students.

Most school finance analysis has been descriptive, Augenblick asserts, with only a small fraction of it qualifying as inferential. Descriptive school finance analysis compares, for example, per-pupil spending for instruction from one state to another. Descriptive analyses make comparisons over time, and compare to some benchmark such as a national average. Inferential analysis seeks to explain why the per-pupil spending for instruction in one state differs from that in another. Such differences are often attributable to some measurable characteristic, such as the state median income.

To do such comparisons, policymakers have to get data. Often these data are not routinely available from state administrative record systems, such as those kept by the state department of education and its finance division. Some of these data are nonstandard, that is, they are at the pupil, classroom or school level, rather than at the school district level. Acquiring uniform, comparable school finance data is the goal of the NCES school finance collection reforms. To achieve this goal, NCES focuses upon defining and standardizing data.

Based upon his interviews, Augenblick finds that state policymakers perceive the most important information to be the allocation of state funds to school districts. He asserts that school finance data are not influential in creating new school finance systems, or in evaluating the efficacy of existing school aid programs. Otherwise, state policymakers are interested in statewide averages to compare their state to other states. These comparative data should be timely, accurate, and comparable from state to state.

Information has little effect on state school finance policy development, as that policy is not based upon objective, rational evaluation. Instead, decisions arise from the amount of revenue available, and the incremental changes possible, along with the politics always associated with distributing state aid. Making more data available essentially has no effect upon the process, according to the interviewees. Indeed, there is a bias against detailed information, as policymakers become more concerned that the data are not comparable.

Policymakers are more interested in issues than in data. For example, they wish to know if their state is more inequitable than other states. The assessment of equity requires sophisticated analytic techniques in school finance, of which most state policymakers are unaware. Augenblick argues that rather than expanding the databases, NCES should focus on such issues as school finance equity and adequacy, the linkage between funding, services and pupil performance, and topical areas, such as special education and school facilities needs. Most policymakers were also in favor of certain NCES products, such as an interstate price adjustment, and an inflation adjustment.

The second perspective on the nation's data needs in school finance is presented by **Susan H. Fuhrman**, of the University of Pennsylvania. Fuhrman asserts that policymakers care little about resource disparities, having become more concerned with the linkages among resources, practice, and student outcomes. Using this assertion as a backdrop, she examines what types of data are valuable for policy makers. Policymaking in the 1990's has shown three trends. The first is the development of standards for students to attain. A second trend is attention to the results of schooling. The third identifies the mechanism by which finance issues are related to student standards and educational results. All have implications for the types of data sought by policymakers.

Fuhrman calls the movement to develop standards for student learning *systemic school reform*. Within the movement, the major development is challenging expectations for student learning in core subjects. More than 30 states have established curriculum frameworks as a first step. Systemic reform also implies policy coherence. States are integrating policies directly linked to curriculum, such as instructional materials, student assessment, teacher certification, and teacher professional development. Most states are establishing ambitious expectations for student learning and aligning various policies with the standards.

Related to the development of standards for student learning are accountability programs on student performance. In the realm of school finance data, two aspects of the accountability movement are apparent: States have deregulated, that is, they have waived rules for schools performing at an acceptable level; and the school has become the unit of accountability. There are many obstacles to removing regulations for school districts. These concerns come about from the absence of outcome measures, and the fear that a lack of regulations will deprive some students of equal opportunity. These fears also arise from "bad apples," that is, habitually noncompliant school districts.

Increasingly, as performance-based accountability becomes more common, the spirit of the law has moved from the school-district level to the school level. In part, this is an extension of the belief in flatter organizations. It is also a reflection of the failure of previous district-level interventions designed as remedies for low performance.

Fuhrman also argues that the linkage between performance and resources is becoming more stringent. State courts have held state systems inadequate, based upon outcome evidence. Legislatures have specified performance-based systems in Kentucky, Missouri and Texas. School aid formulas now support professional development in Minnesota and Missouri. Kentucky and other states are now planning to begin monetary rewards for achievement. In the private sphere, for-profit firms are offering to run schools within school districts more efficiently than the school district presently does.

What are the implications of these developments for school finance data? First, Fuhrman asserts that policymakers want finance data about individual schools. This requires that we know how school districts distribute funds to schools, and what schools do with the funds. It also requires that we know how the school-level funds are related to student outcomes. She argues that school-level accounting should be in place, even if schools do not currently control resources.

School-level accounting by function (that is, instruction, school administration, etc.), and object (salaries, fringe benefits, supplies, etc.) is not informative enough to explain where the money goes in schools. Rather, future work will involve devising new paradigms that enable policymakers to comprehend a school's educational program and its resource level.

Another reason for comparing resources is to judge the degree to which students in various schools have equal access to necessary services. Some time in the future, policy makers could probably predetermine the cost of an equitable and adequate program. "Program" should not be defined in the way it is today, for example, as a "bilingual" program. Instead, resources will be linked to effective classroom practice. In an interim step, finance data on reform initiatives in schools and school districts would at least enable policymakers to learn the effectiveness of current practice.

Besides these financial data, Fuhrman also contends that information about the constraints imposed on school resource use would be essential. For example, school responses to school finance formulas, union contracts, school district policies, and state regulations may explain why schools spend the way they do.

Another perspective on the nation's data needs in school finance is presented by **William Cooley**, of the University of Pittsburgh. Cooley argues that the essential question is not what data to collect, but rather what statistical analyses will inform the policy questions raised by Fuhrman. Surprisingly, his answer is multiple, intrastate studies. These studies may contain not only revenue and expenditure data, but global educational information about students and their attainments. They may also contain student and community demographics, staff characteristics, program and curriculum information. Cooley asserts that states routinely have this information in their department of education databases. However, they are not comparable from state to state, which prevents the construction of a national database.

Cooley also presents an example of the intrastate type of statistical analysis he favors, recounting an analysis by Ferguson (1991). Ferguson examined teacher quality and school district expenditures, and their relationship to student attainment. Assembling a single data base for some 900 Texas school districts, Ferguson drew upon financial, student and staff and demographic data from the Texas Department of Education. He combined these data with socioeconomic measures from the U.S. Census. He found that teachers with higher test scores, in school districts that spend more per student, had students who achieve higher test scores. Cooley argues that replications of Ferguson's study, either confirming or rejecting the findings, would dramatically affect the debate on how to cause better student performance.

State-specific data allow flexibility that uniform national data bases do not. For example, in one state, a measure of the wealth of the school district might be the number of children in poverty. In another state, it might be the median housing value. Provided the measure was uniform within the state, it would suffice. Most student test scores are specific to the educational interests of the state. In addition, analysis of such databases takes place at a fraction of the cost of a national database. An example is the National Center for Education Statistics' National Assessment of Educational Progress (NAEP), which is the only nationally representative sample of student outcomes. NAEP is not available at the district and school level. NAEP state estimates added additional thousands of dollars to the cost of the survey. Cooley also argues that little is known about school district responses to changes in state school aid systems. Such a study is ideal for the type of multiple intrastate study he advocates.

There are barriers to the construction of even a state data base, such as the Texas study conducted by Ferguson. Part of this difficulty comes from bureau "ownership" of the relevant data, and reluctance to release them. Insufficiently staffed bureaus are unable to do more than acquire and release data. Confidentiality and the fear of embarrassing results may be a factor inhibiting data releases. Cooley describes his own success at building a state education data base for Pennsylvania.

The remaining three papers concern emerging school finance topics that pose statistical and measurement problems for NCES. The first of these more technical papers is by **Henry M. Levin and Cyrus Driver** of Stanford University. Levin and Driver contemplate a change from the existing educational system, supported by state financing and governance, to a new system, supported by educational vouchers. In this work, they consider the costs of the infrastructure to establish and maintain an educational voucher system. Levin and Driver first describe the specifics of a particular voucher system, the setting, and the likely behavioral responses of households. They then estimate the cost of a voucher system. They conclude that the costs of a voucher system would exceed the costs of the current public school system.

Levin and Driver select five arenas in which to estimate costs of moving to a voucher system: accommodating additional students; record keeping; transportation; information dissemination; and adjudication of disputes. For each of these topics, Levin and Driver explain why the arena is the nucleus of a voucher plan. They also discuss how to measure the costs in the arena (with illustrative costs), and the magnitude of the difference from the existing system. For example, the additional cost of publicly financing students who are attending nonpublic schools is uncertain. It would depend upon the number eligible for funding, the amount of the voucher, and the lower level of cost that most private schools enjoy, compared to public schools.

Levin and Driver examine analogous systems in their quest to capture the range of potential costs of a voucher plan. To estimate record-keeping costs of a voucher plan, they innovatively examine the federal Social Security Administration's (SSA) eligibility mechanism for its 38 million beneficiaries. Perhaps most intriguing is the Levin and Driver argument that a complex voucher system will require the resolution of disputes regarding eligibility for a given voucher amount. Resolving these disputes will increase the cost of a voucher plan. To estimate these "adjudication" costs, Levin and Driver turn to the costs of special education due process hearings for parents of special education children who disagree with the placement of their children by their school district.

Levin and Driver conclude by saying that the cost ranges they provide for construction of a publicly-funded voucher approach to education should be considered provocative rather than definitive. They propose further work proceed, with some considerable previous experimentation. Levin and Driver also admit no knowledge of potential cost savings by reducing the public systems. They conclude by summarizing their findings.

A geographic cost adjustment was the subject of the initial *Selected Papers* (Brazer 1975). The dilemma is that two school districts located in different areas in the country may appear to be spending different amounts per child, while they are purchasing equal educational resources. What all cost-adjustment techniques attempt to do is to identify the additional costs associated with one geographic area versus another. Availing himself of a new NCES database that mapped 1990 community demographic information from the U.S. decennial census to school districts, **Walter W. McMahon** of the University of Illinois at Urbana-Champaign undertakes the most recent effort to construct a cost-of-living (COL) adjustment.

McMahon explains that a COL adjustment differs from a cost-of-education (COE) adjustment. A COL adjustment attempts to measure the cost of living faced by local employees, including school district employees. A school district's budget predominantly consists of the salaries and fringe benefits of its staff, which include the cost of living in the labor market. The staffs' cost of living reflects housing costs, grocery costs, transportation, heating and cooling, and the like.

In comparison, the weighted prices paid by a school district for staff salaries help construct a COE. Weights reflect the size of an item in a school district budget. Recently, a COE held constant teachers' salaries for differences in degree status and experience (Barro 1992). COE indices often consider additional costs, such as educating students in poverty that are more expensive to educate. Other COE equations may consider the supply and demand of staff, that is, whether a school district must offer additional funds to attract and retain talented teachers. Most COE indices also consider amenities. For example, a school district located in a resort community, or in a college community, may be able to offer lower salaries and still attract and retain talented staff (Chambers 1995).

COL advocates, such as McMahon, decry the use of a COE, because they assert that prices should not be subject to the control of the school district. One purpose of a cost index is to adjust state aid to school districts. McMahon argues that a COE is inappropriate because a school district's salaries and fringe benefits are manipulable. COE advocates retort that cost of living is but one of the causes of differences in school district spending, and that staff employed by a school district may not live in the school district's cost area.

Although McMahon devises indices for all school districts in the nation, in this text he displays his cost-of-living results for school districts within Illinois. Conveniently, he maps the county results for Illinois, and shows a pattern from high cost (near Chicago) in the north (21 percent higher costs), to low cost in the south (6 percent lower costs). He concludes that across the nation, living costs range from about 78 percent higher in the highest-cost MSAs to 11 percent lower in the lowest-cost nonmetropolitan areas within each state. McMahon argues that a county-wide cost adjustment is desirable, rather than a school-district wide adjustment, as county-wide prices are not subject to manipulation by local districts or state-level interest groups. In addition, county-wide indices do not involve the higher costs associated with a particular pupil population in a given school district.

Nevertheless, the method shown here might be considered simply as one approach to adjusting for geographic differences in cost. Eventually, the most appropriate method of making regional cost adjustments will achieve consensus. When that occurs, the methodology will explore equity in expenditure per pupil, and school district efficiency, and adjusting state education aid formulas.

Another measurement issue arises with the recent development of "opportunity-to-learn standards" or "school delivery standards." There is a new orientation to hold students, schools and school districts accountable for learning. One problem that has arisen is holding students accountable who have not had access to high-quality teachers and courses accountable. Emerging work seeks a clear understanding of how to define and measure opportunity-to-learn (OTL). Research continues on the costs of gathering and carrying out such standards. In the last paper in this series, **Allan Odden**, of the University of Wisconsin, undertakes the task of providing a conceptual and historical framework for defining OTL standards. He also identifies several variables that could be selected to represent opportunity to learn. He then discusses the costs of obtaining measures for these variables, and then makes some preliminary comments on the costs of carrying out OTL.

Odden argues that the phrase "opportunity-to-learn" is simply the 1990s version of the 1960s phrase "equal education opportunity" (EEO). The goal of both phrases is good education for all children. Perhaps one reason OTL seems different is that the previous focus was on inputs, without explicitly mentioning student achievement. Conversion of EEO to OTL began with the minimum competency movement. The phrase first arose in a court case that developed after a state enacted a test requirement for high school graduation. The court ruled that the test requirements had to be gradually phased in. This allowed students to have the "opportunity to learn" the material before taking the new high school tests. The phrase is now more widely used.

Dissatisfaction with student achievement first led to more difficult input requirements for school districts. For example, states enacted higher licensing standards for teachers, and then, with the adoption of National Goals, more difficult output requirements for student attainment. The predicament is that attention to student achievement does not result in improvement. One cannot focus solely upon outcomes, while ignoring differences in inputs and educational processes. What then guides the section of OTL variables that could be measured and collected? The keys are parsimony and a research connection to student achievement.

Odden suggests collecting variables to represent OTL in three specific categories: finance; educational processes; and teacher quality. He makes no claim to be exhaustive, rather, he seeks to be illustrative. For example, in the fiscal realm, progressively narrower expenditures per student could be selected from current operating expenditures per pupil, to core educational expenditures per pupil, to instructional expenditures per pupil. Expenditures must reflect scale economies and student need and geographic price differences. Analysis of standard fiscal equity measures occurs with adjusted expenditures. Possible educational process variables which correlate with student achievement include time spent on classroom instruction, high school course-taking patterns, college entrance requirements, and "enacted curriculum," (curriculum used in classrooms). For teacher quality, teacher certification by the National Board for Professional Teaching Standards might be a suitable OTL variable, as would scores on teacher licensure examinations.

Having specified candidate OTL variables, Odden then turns to detecting the costs of collecting these representative variables. In the fiscal arena, NCES already provides the raw expenditure data for every school district in the nation on the Common Core of Data (CCD) CD-ROM. In addition, NCES has mapped 1990 decennial Census data to almost every school district in the nation, and placed a subset of those variables (median income; median housing value; number of children in poverty; number of children who speak English poorly) on the CCD CD-ROM. All that remains (which is far from trivial) is to compute the desired equity measures.

Looking at the cost of collecting educational process variables that capture OTL, Odden again turns to NCES data collections. The NCES Schools and Staffing Survey (SASS) survey, administered to some 65,000 teachers every several years, queries elementary teachers on the percentage of time they allocate to instruction in core content areas, and secondary teachers about the content they teach. With minor adjustments, these questions could capture nationally the time allocated to instruction in elementary school and the courses offered in secondary schools.

Odden also argues that a modification of the National Assessment of Educational Progress (NAEP) could yield information on the enacted curriculum. This would replace current questions about the curriculum content taught, and teacher instructional practices, which are not suitable to OTL measurement. However, SASS seems a more appropriate vehicle for more specific and comprehensive curriculum and instructional data. Additional questions could be added to both surveys regarding teacher quality.

As a final step in assessing the costs of measuring OTL, Odden turns to setting up costs. This most strenuous task looks at conceptualizing implementation. Fiscal variables, for example, might be the least precise indicators of opportunity to learn. One example is raising all spending in the nation to $5,000 per pupil. Other strategies would be to select the median and average per pupil expenditure, and raise all districts to that figure. The enacted curriculum can employ existing time, teachers, and classes more effectively. This involves no increase in operational costs. However, there is the need for both preservice teacher training and substantial inservice teacher training to enable all teachers to provide the new curricular version of OTL. New professional development, combined with some necessary preparation for board certification will result in increased teacher quality. Another strategy would be to pay the costs of teachers taking the courses that result in preparation of the new curriculum standards, and in board certification. This would be in place of paying teachers additional funds for more course credits and higher degrees.

Odden concludes by noting that since the concept of OTL is still developing, this paper is only an initial exploratory effort. Identifying the costs of measuring and implementing opportunity to learn is difficult. Whereas once information such as Odden suggests was simply unavailable and unimaginable, several routine NCES data collections begin to approach the type of information needed to assess OTL. An investment of several million more dollars in NCES data collections might achieve the desired OTL information.

Previous work

The papers in this volume did not evolve spontaneously. As early as 1985, NCES had solicited invited papers concerning the Elementary/Secondary Education Data Redesign Project, and combined them into a synthesis. The Redesign Project was

> a broad, public, open outreach to the education community to suggest ideas from improving the adequacy, scope, content, accuracy, reliability, and usefulness of the Nation's data for education policy, administration, and research purposes (Silverman and Taeuber, 1985).

Very few aggregate items remained on the NCES finance collection after the Paperwork Reduction Act of 1980. This reduction severely limited the ability of the data to address policy issues in school finance. As a result, much criticism of NCES school finance data appeared in the synthesis (pp.15-16). NCES fiscal data were described as "skeletal," without detail and disaggregation, lacking in timeliness, and lacking essential items.

Subsequently, an extensive redesign of the NCES state and school district financial collections took place, beginning in 1987 NCES published a new financial handbook for states and school districts (Fowler 1990). The Center established a computerized mechanism to make financial data comparable from state-to-state, by disaggregating accounting codes, and uniformly recombining them, termed a "crosswalk." NCES created a new state-level survey, The National Public Education Financial Survey (NPEFS), with the detail designed to answer the critics in the synthesis. NCES created an extensive instruction manual, and yearly training for state respondents. The Center also published a Federal Register Notice, containing a deadline for responding to the NPEFS. Regular, timely publications of NCES fiscal data occurred (Johnson 1993), with some extensive explorations of the detail in the state data (Fowler et al. 1993) and intensive school district analyses (Parrish, Matsumoto, and Fowler 1995).

The state level effort also occurred at the school district level, with NCES obtaining as its collection agent the U.S. Bureau of the Census, Governments Division. Census had long conducted a school district finance collection (F-33) as part of a larger collection of government finances, by obtaining school district financial data from state administrative records. Census conducted a universe collection quinquennially (in the second and seventh year of each decade, for example, 1982 and 1987), and a sample of school districts in other years.

NCES supplemented the routine Census collection in a variety of ways. NCES financed a special universe collection for 1990 fiscal data, matching all school districts to another NCES effort, the school district mapping project. The school district mapping project took 1990 Census demographic data, such as median income for communities composing a school district, and mapped the data from each community to a unified data set with school district boundaries. Combined with the special 1990 universe collection of school district finance data, the school district mapping project made available school district expenditure data by community characteristics. This combined data set permitted the first national study to carefully examine school district spending by community and student characteristics. The study adjusts for geographic cost differences, and uses sophisticated multivariate statistical techniques to control for the simultaneous influence of more than a single school district characteristic (Parrish, Matsumoto, and Fowler 1995).

NCES also encouraged Census to expand its 1992 school district survey form to include items of research interest. For example, financial data were collected on salaries and employee benefits for each accounting function (instruction, school administration, operation and maintenance, etc.), allowing the creation of "profiles" of school district spending. In addition, new detail exists for state revenues to school districts (such as equalization aid, transportation aid, compensatory education programs, capital outlay aid, etc.), and for federal revenues to school districts (Chapter 1, children with disabilities, etc.). Finally, beginning in 1995, finances for all school districts will be reported every year.

Besides routine and analytic reports, these data were placed on a CCD CD-ROM. A CD-ROM is a new technology for storing data on personal computers that looks remarkably like an audio CD. There are two major advantages to this technology. Large quantities of data and documents can be placed on such disks. Software on the disk permits the user to browse through the data, build tables, and download smaller, selected data sets for use by spreadsheet programs as LOTUS and sophisticated statistical analysis programs, such as SAS and SPSS. The 1994 CCD CD-ROM contains five years of state-level fiscal and nonfiscal data, three years of school district fiscal and nonfiscal data, and five years of school-level nonfiscal data. In addition, it contains a single year of selected 1990 Census demographic data, mapped to school district boundaries.

Summary

The papers published here are a component of the continuing efforts of the National Center for Education Statistics to obtain and provide education finance data of interest to the school finance community. NCES also wishes to make known conceptual and methodological advances in the field of education finance, for researchers and students alike to emulate, replicate, disseminate, and enhance. NCES hopes to make this series of papers a continuing annual publication.

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Recommendations to the National Center for Education Statistics to Improve Its Role Regarding School Finance Data: The Perspective of State Policymakers

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About the Author

Dr. John Augenblick is president of Augenblick, Van de Water & Myers (AVM), a Denver-based consulting firm he helped found in 1983. AVM works primarily with state-level policymakers on education issues, particularly finance issues. He was a staff member of the Education Commission of the States (ECS) from 1976 to 1983, directing the Education Finance Center for several years. Before joining ECS, Dr. Augenblick served as an elementary school teacher in Connecticut and as Director of Research for the New Jersey Commission on Financing Postsecondary Education.

Dr. Augenblick holds a B.S. from the Massachusetts Institute of Technology, an M.A. from Teachers College at Columbia University, and an Ed.D. from the University of Rochester.

Since 1976, Dr. Augenblick has provided assistance to numerous states on issues related to education finance. He has developed state aid formulas used in Kentucky, Louisiana, and New Hampshire, and he has evaluated such formulas in more than 20 states. He has also served as an expert witness in school finance litigation, testifying for plaintiffs in Minnesota, Missouri, Montana, and North Dakota and for defendants in Kansas, Maine, and Wyoming. Dr. Augenblick is a member of the American Education Finance Association and served on its Board of Directors from 1983 to 1986.

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The purposes of this paper are to examine the data needs of policymakers regarding school finance issues and to make recommendations to the National Center for Education Statistics (NCES) on ways to improve the agency's role in providing useful school finance data to the policymaking community. It is important to consider the perspective of data users when making recommendations about NCES's policy on school finance data. Thus, I chose to focus on state-level school finance policymakers, since, to a large extent, school finance decisions are made by these individuals. In preparing this paper, I interviewed several members of the school finance policy community, all of whom were familiar with school finance data and school finance issues. They shared their perspectives on how data are used in making school finance decisions and how NCES might improve its approach to school finance data.

This paper is organized into three sections: a description of school finance issues and data, a summary of interviews, and recommendations to change the way in which NCES deals with school finance data. As its author, I am solely responsible for the contents of this paper; thus, my recommendations do not necessarily reflect the views of any individual whom I interviewed or the agency for which he or she works.

School Finance Issues and Data

When individuals use the term "school finance," they are generally referring to the revenues and expenditures of publicly-organized and supported schools that provide instruction in grades K–12 in the Nation's more than 15,000 school districts. School finance encompasses an enormous enterprise that provides services to about 40 million pupils, employs several million people, and spends more than a quarter of a trillion dollars for such items as salaries, personnel benefits, supplies and materials, facilities maintenance, and transportation services. Broadly speaking, school finance can also cover the services provided by nonpublic elementary and secondary schools, some of which benefit directly or indirectly from public support or tax policy provisions, as well as the wide array of noninstructional services provided to young people to increase their school readiness or productivity.

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The driving force behind school finance decisionmaking is comparison…

To many policymakers, school finance is primarily concerned with the procedures by which states allocate support to school districts and the associated controls states place on the taxing and spending behavior of school districts. Discussions of school finance traditionally have focused on a few key philosophical issues, including equity and adequacy (with some concern for efficiency) and on a plethora of technical issues—from procedures for counting pupils to alternative approaches for defining and measuring the needs and fiscal capacities of school districts.

Nearly all school finance analysis has been descriptive; only a small fraction has been inferential. The driving force behind school finance decisionmaking is comparison; comparison of one state to another or of one district to another in terms of per-pupil spending for instruction, pupil-teacher ratios, average salaries of teachers, property wealth per pupil, local and state tax rates, etc; these elements have changed over time; and comparison of these elements with some benchmark, typically a national or regional average. Comparison is used to make judgments about setting the levels of school finance parameters and about the factors used in state aid formulas to distribute funds; it also is used to evaluate the efficacy of school finance systems.

Because comparison is the basis for talking about school finance, much of the discussion is data-driven. The kinds of data that enter into such discussions reflect:

- characteristics of pupils and costs associated with providing services to pupils with different characteristics (e.g., pupils enrolled in special education programs);
- characteristics of teachers, the primary employees of school districts (e.g., training and experience of teachers, factors which are the basic components of salary schedules);
- characteristics of school districts (e.g., size, wealth, and tax effort);
- sources of school district revenue, with an emphasis on distinguishing among state, local, and federal sources and a concern for the equitable distribution of resources (e.g., whether state funds are distributed with consideration for the fiscal capacity of school districts); and
- school district spending, with an emphasis on a set of standard accounting categories (such as instruction or administration) to facilitate comparison.

Other issues have attracted the attention of the school finance community, some of which have required analysts to move beyond comparison as the basis for drawing conclusions and some of which have required the use of more sophisticated data. For example, there has long been an interest in the relationship between how much is spent on education and how well pupils perform. Unfortunately, past efforts have yielded little information that is useful to policymakers and have led to the conclusion that what goes on in schools has only a tenuous link to performance.

There also has been an interest in the behavior of school districts, particularly in the taxing and spending decisions they make and the impact different state aid allocation procedures have on those decisions. To investigate these issues, it has been necessary to obtain nonstandard data (that is, data not derived from the budgets or balance sheets of school districts, not collected routinely by states, and containing much more detail about the characteristics of school districts, teachers, or pupils) on schools, classrooms, pupils, or teachers rather than on school districts.

The environment in which school finance decisions are being made is changing. Since 1983, when *A Nation at Risk* was published, the federal government, states, school districts, schools, and a myriad of other organizations have analyzed schools, documented their failures, and recommended changes in how they are governed, what they do, how they are evaluated, and how they are funded to improve pupil performance. Different approaches to restructuring schools have important implications for school finance, most of which have received cursory attention. For example:

- Education-governing structures are placing more emphasis on school-level decisions and requiring financial information at a different level of disaggregation.
- The accreditation of education institutions is changing, with an increased emphasis on pupil performance rather than on the kinds of resources provided to pupils.
- New ways of thinking about the professional development of teachers are emerging that focus on skills and behavior rather than on formal education and experience.
- A new focus on inclusion as a way to provide services to pupils with special circumstances changes what policymakers need to know about such pupils and the services they receive.
- The expansion of school choice raises a variety of questions about who should pay for schools.
- The expanding use of technology to deliver education services may have significant financial implications for states in general and for rural school districts in particular.
- The proliferation of links between the provision of instruction and the host of social services provided to children increases awareness of the costs of such services, methods to integrate funding of all social services, and methods to measure how these services improve the lives of children.

In the past, school finance has been a topic analyzed in isolation, independently of what else goes on in the education community. In fact, almost no substantive connection has been made between finance and any other aspect of the education enterprise except, perhaps, governance. This situation is changing slowly as the need to link funding to systemic change increases. School finance litigation, a driving force behind attempts to change school finance systems, also is evolving. While it was once possible to focus primarily on the variation in school districts' revenue levels as the basis for alleging the unconstitutionality of a school finance formula, plaintiffs now supplement their concern for interdistrict revenue equity with concern for the equity of specific kinds of resources and for adequacy in both the level of resources available and pupil performance.

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School Finance Data: The Perspective of State Policymakers

Many of the school finance data currently available are collected and organized to answer questions based on the politics of school finance, which chiefly concern questions about who allocates support, how much is allocated, where it comes from, who receives it, etc. School finance is highly political, for several reasons:

- The primary source of school funds in many states is state general fund revenues. School funding is typically the largest single item in a state's budget and may consume between one-fourth and one-third of all state general funds.
- Local funds are derived almost exclusively from property taxes, reported to be the least liked of all taxes. In many communities, parents

with school-age children represent a small portion of the voters, making it difficult to generate local funds for schools.

- There are numerous groups interested in school finance issues, including school boards, administrators, teachers, parents, taxpayers, large school districts, small school districts, groups representing pupils with special needs, geographically determined groups, and others. Each group monitors potential changes in the distribution of funds in an effort to increase its share of available revenues.

Because school finance is so political and because the states play such an important role in providing support for schools and in controlling the fiscal decisions of school districts, state-level policymakers are the primary users of school finance data. It is important to understand the perspective of such individuals in advising NCES about school finance data activities. In preparing this paper, I discussed school finance data issues with seven individuals from around the country, all of whom have participated in school finance policy debates at the state level.[1] These individuals have participated in discussions of school finance issues for many years; they also have helped to evaluate existing school finance systems, propose modifications, and develop procedures for allocating state support to school districts to improve the equity and adequacy of school support. My sense is that the views of these individuals are representative not only of the professional staff who deal with school finance issues but of those elected and appointed officials for whom they work.

Because school finance is so political and because the states play such an important role in providing support for schools and in controlling the fiscal decisions of school districts, state-level policymakers are the primary users of school finance data.

What Role Do Data Play in School Finance Policy Development?

The individuals I interviewed suggested that data play a relatively small role in creating new school finance systems or evaluating the efficacy of existing structures. They felt that the allocation of state funds across individual school districts within a state and the changes made, over time, in the distribution of state aid were the most important information used in the development of school finance systems. Any other data used by policymakers tend to be highly aggregated (that is, statewide averages), and they are used in setting the parameters for school funding formulas.

When finance policymakers compare their state with others or examine how things have changed over time, they typically use the following indicators:

- Current per-pupil operating expenditures, sometimes disaggregated by function;
- average teacher salary levels;
- number of employees or pupil-teacher ratios;
- State support as a proportion of all school support; and
- State school support as a proportion of all state general fund spending.

The individuals with whom I spoke emphasized the importance of these indicators and how critical it was that the indicators be accurate (or at least that policymakers understand precisely how the indicators are defined and the extent to which they are comparable across states over time) and timely (data should not be more than 2 years old). All of the individuals interviewed indicated that there were a few policymakers, typically fewer than 10 in any state, who were interested in examining more data. In particular, those policymakers would like to see data that are relevant to particular topics, such as, how funds are spent, differences in costs among school districts with different characteristics, and types of services provided to pupils with different needs.

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[1] Interview subjects were: Tom Bilodeau, school finance analyst for the Montana Education Association; Mary Fulton, school finance policy analyst at the Education Commission of the States; Deborah Godshall, representative for school finance issues on the Colorado Legislative Council; Tim Kemper, responsible for school finance issues at the Nebraska Department of Education; Jim Watkins, director of the Management Information unit at the Maine Department of Education; Terry Whitney, responsible for school finance issues within the National Conference of State Legislatures' Education Program Division; and Tom Willis, fiscal analyst for education on the Kentucky Legislative Research Council.

It was somewhat discouraging to learn what little impact information has on policy development, at least as far as school finance is concerned. Anyone who thinks that school finance policy is developed in a completely rational way, based on an objective evaluation of the best information available, is unfamiliar with the process actually used. Decisions are based primarily on the examination of fiscal changes, and implementation is largely driven by available state revenue (that is, an agreed-upon amount of state funds and the relative priority of education) and the political machinations associated with distributing a fixed amount of resources.

What the interviewees made clear is that making more data available would not, in and of itself, improve the decisionmaking process since data are essentially tangential to the process. In supporting the view that better data are not the sine qua non of policymaking, they stressed the importance of anecdotal information to policymakers. The individuals with whom I spoke indicated that, typically, only a few individuals in any given state are involved in discussions about school finance, and they are enormously influenced by pieces of information that drift by them in an unorganized way. Such information can be extremely influential, particularly at the margin of policymaking, after major decisions about how much a state can afford to spend have already been made.

Of course, as the interviewees pointed out, policymakers also want to know the policies and procedures used in other states, particularly the parameters used in writing school finance formulas. What policymakers do not want are enormous amounts of information that are not easily accessible or that are hard to find, difficult to compare, or presented in a form that requires investing great amounts of time. The more detailed the data, the more concerned policymakers become about definitions and comparability. It is also interesting that the individuals with whom I spoke are not interested in gaining access to large quantities of computer-based data (for example, data stored on CD-ROM), because they do not have the time to work with it.

Where Do State Policymakers Get Their Data?

To the extent that state policymakers use data in making school finance decisions, the sources of the data tend to be hard-copy reports routinely produced by their own state agencies and computer-based simulation models. In both cases, the data comprise intrastate district-level information obtained from reports that school districts are required to prepare for their state department of education.

State policymakers also obtain state-level comparative data from a variety of national sources, including NCES (such as the *Digest of Education Statistics*, *The Condition of Education*, and special reports), the Bureau of the Census (such as *State Government Finances*, *Public Education Finances*, and *Finances of Public School Systems*), the Advisory Commission on Intergovernmental Relations (such as *Significant Features of Fiscal Federalism*), and the National Education Association (such as *Estimates of School Statistics*). State policymakers also refer to

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Public School Finance Programs of the United States and Canada, a document prepared by the American Education Finance Association and supported by NCES, for information about the structural characteristics of school finance formulas.

For information about policies and procedures, state policymakers tend to contact the Education Commission of the States or the National Conference of State Legislatures, which field hundreds of calls about school finance litigation, parameters used in school finance formulas, and statutory requirements. Policymakers in the southern states tend to rely on the Southern Regional Education Board for both data and descriptive information. University-based policy centers are an increasing source of information. These centers produce state-specific data by massaging data routinely collected by state departments of education and formatting them to answer basic questions about changes over time.

The primary strength of these data sources is that they are perceived to be neutral, which is a critical characteristic for state policymakers who tend not to rely on any source that appears to represent a particular point of view, regardless of whether the information is, in fact, impartial. In some states, policymakers even dispute the data, or the interpretation of the data, prepared by their own state education agencies. In general, the information produced by these sources is considered to be accurate and focused on the types of information policymakers find useful.

Unfortunately, there are a variety of problems associated with these data sources. First, the data are not always timely. Policymakers are reluctant to use data that must be updated because they are concerned about using inflation adjustments for more than a year or two. While much of the data collected and disseminated by state departments of education become available relatively soon after they are collected (policymakers may have access to 1-year-old data and, certainly, 2-year-old data for their state), it is difficult to compare states without using data that are 3 or 4 years old. While such data still are useful, particularly given the relative stability of school finance information, older information is less attractive to policymakers, reducing the likelihood that it will be used in policymaking. Policymakers are willing to make some concessions as far as accuracy is concerned in order to have recent information (which explains the popularity of the National Education Association data for some policymakers).

Second, questions always arise about the accuracy of data, particularly when multiple sources disagree about particular figures. The inability to compare data developed in a particular state to data prepared for that state by another agency exemplifies this problem. Despite the investments that have been made to improve the accuracy of data (through such efforts as the NCES-sponsored Crosswalk Project), it remains typical that data coming from multiple sources differ, particularly at the high levels of aggregation to state policymakers request. Apparently, states continue to define even the most basic data elements somewhat differently. In fact, the individuals with whom I spoke were less interested in having an agency such as NCES solve the problem than in making sure that published data are precisely defined.

Third, data are not provided in a form that policymakers find convenient. Policymakers want data to be packaged simply, not in ways that make them difficult to locate or that require an extensive investment of time to be useful. Interviewees suggested that massive publications are difficult to use; the interviewees also were not particularly interested in computerized data, even though such packaging might give them more flexibility in manipulating data elements. (However, some interviewees said that they would be interested in manipulating computer-based data to answer their own questions if the system was large, district-based, and easy to use.)

How NCES Can Be Useful to State School Finance Policymakers

I have concluded from my discussions with policymakers that they are more interested in issues than in data. Other than the need for accurate, timely data identified earlier, policymakers are not interested in data per se, and certainly not in vast quantities. They want information that is relevant to current issues. While NCES has organized some of its data in this way, the data it selects tend to be somewhat removed from the issues state policymakers face. For example, policymakers would find useful a comparison of the level of equity achieved by their state's school finance system to the levels achieved by other states. This comparison would require defining equity, developing equity measures, obtaining and analyzing relevant data, and preparing a report of findings. The interviewees believe that it would be useful for NCES to oversee the entire process of collecting and analyzing school finance data (the interviewees were not aware of the agency's work in this area, the results of which will be released in approximately a year). The individuals with whom I spoke would rather have less information and more analysis; for them, information is most useful when there is a framework for examining it.

Recommendations for Improving NCES's Role

Based on my own experience and the views of the individuals I interviewed, I believe that NCES should fundamentally reevaluate its school finance data-collection activities. It is my perception that what characterizes NCES's efforts is the acquisition of many data elements organized around the broad categories of revenues, expenditures, pupils, and teachers. Much effort has been expended to improve the comparability of data elements and access to those data. Much of the information is organized at the state level, with some information being available at the district level. In my opinion, continuing to expand the data base and to provide wider access to that data base primarily serves the needs of the research community or district-level policymakers and managers (school board members and administrators), both important groups for NCES to consider. If NCES wants to serve the needs of policymakers, particularly at the state level, it needs to take a different approach, one that focuses more on issues and less on data, one that favors quality over quantity, and one that is multifaceted, including data analysis, not just data collection.

Without knowing much about how NCES is organized or what its resources are, it is difficult to suggest reasonable changes. However, based solely on the interests of one set of data users, my sense is that NCES should focus on three types of activities: collecting a small set of standard state-level school finance data elements that are as accurate as possible and making them available in a timely manner; collecting a larger set of data elements, perhaps on a periodic basis or using a sample of cases to reduce associated costs; and developing a list of issues on which to focus attention, then conducting the appropriate data collection, analyses, and results dissemination.

The policy community first must have access to a set of basic indicators at the state level. These indicators, such as expenditures per pupil or average teacher salary, should be accurate (at least the differences between the states must be understood); be available as near to "real time" as possible; be accessible electronically to avoid publication-related delays; and be available every year. Building on its long-standing related efforts in this area, NCES should develop a list of such indicators with the help of the policy commu-

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One of the issues state policymakers want to know more about is equity; in particular, how states compare with one another.

nity and should assure that it is routinely available.

NCES then should consider maintaining a secondary group of indicators that is collected periodically (perhaps every few years rather than every year) and based on sampling or some procedure less expensive and time consuming than obtaining raw data from every school or district in the nation. Policymakers are particularly interested in personnel benefits, expenditures for special education services, definitions of at-risk pupils, expenditures for technology, administrative expenses, and capital expenditures. Obviously, the more detail that can be obtained about these elements, the better; policymakers would especially appreciate having such data organized by state as well as by school district characteristics (size, for example). However, if nothing more than a national average were available, even every few years, my sense is that policymakers would likely benefit. Again, NCES (through such mechanisms as the Schools and Staffing Survey (SASS)) and other federal agencies, such as the General Accounting Office (GAO) (through its recent study of school facility conditions), are attempting to respond to this need.

NCES primarily should focus its attention on a set of issues, perhaps 4 or 5 at a time, which are studied in depth for a short period, perhaps 3 to 4 years. I believe the following issues should be among the first to receive attention.

Equity Among States

One of the issues state policymakers want to know more about is equity; in particular, how states compare with one another. Policymakers recognize that different states have different objectives, based in part on different legal requirements. There have been only a few attempts to compare states, including the most recent effort by the Congressional Research Service, leaving policymakers with little or no basis for determining the extent to which they are accomplishing one of the basic objectives of school finance. It is not my feeling that policymakers are seeking an annual "report card" on school finance equity. Instead, what they want is guidance on how to look at the issue and information about how the status of individual states has changed over time and in comparison with other states. This issue may become particularly important as the federal government takes a more serious interest in school finance equity, as demonstrated by recent discussions regarding Goals 2000 and the reauthorization of the Elementary and Secondary Education Act (ESEA).

School Finance Adequacy

Another issue of great importance is school finance adequacy. Most states now use some form of their entitlement program as the basis for distributing state revenue to school districts. Yet, most states have made little or no effort to justify the foundation levels (the basic target level of resources) that drive their foundation program. Given that this issue has become a subject of litigation (at least as part of the traditional equity litigation that has proliferated around the country), and that it is associated with the federal government's interest in defining opportunity-to-learn standards, it should come as no surprise that state policymakers are interested in the cost of providing reasonable or adequate education services. My perception is that policymakers are not looking for a definitive number but for other information on which to base their decisions about supporting education.

Linkage

Policymakers would appreciate any information that would enable them to better understand the links between funding, services, and pupil performance. The primary purpose of analysis here is not to deny or confirm that money makes a difference but to understand how best to invest limited resources. Policymakers want to know what specific programs or approaches are successful. Despite the fact that meta-analysis of the relationship between spending and performance yields few useful conclusions for policymakers, limited analysis of early childhood intervention programs has been very helpful to them. Given the increased availability of information about pupil performance, the ability to track resources to individual pupils, and the vast power of computers, NCES can make an important contribution in this area.

Special Education

Special education is an issue that has received much attention from policymakers but is in the midst of great change. In the past few years, the growth in expenditures for special education has been dramatic, causing immense problems for policymakers who must make difficult political decisions. Yet, at the same time, the special education community is changing its views on how best to serve disabled pupils (there is much discussion of "inclusion") and how states should allocate funds in support of those services (the recommendation to move away from systems of classifying pupils and providing differential funding based on classification has been made in several places). Policymakers would benefit from information about the numbers of disabled pupils, the kinds of services they require, the costs of such services, and their impact on pupils.

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Teacher Salaries and Benefits

Policymakers are very interested in teacher salaries and benefits, particularly in terms of alternative ways to pay teachers, comparisons of teacher pay with the reimbursement of other professionals, and costs of alternative approaches to providing benefits. Policymakers are interested in qualitative as well as quantitative information in this area.

Capital Needs

Policymakers want to know much more about the capital needs of school districts. Very little is known about the condition of school buildings, including their capacity and safety; the extent of deferred maintenance; and the cost of meeting the nation's future need for facilities. This issue has been raised in school finance litigation and has enormous fiscal implications that are being ignored by many states, since the primary burden of paying for facilities lies with school districts.

Technology

Several of the interviewees suggested that policymakers need to know more about education technology, including the nature of technology; alternative ways of improving technology; the associated costs of technology; and the impact of technology on pupil performance. The differences in the use of technology between states and across school districts are vast. However, little is known about how much is being spent on technology or about the extent of investment benefits.

Social Services

Policymakers want to know much more about ways to coordinate the provision of all social services—including education—to children. Today, little is known about what services are provided, how much they cost, how state/community needs differ, whether there is duplication of services, and alternative ways to coordinate the delivery of services.

Price Indexing

Several of the individuals I interviewed felt NCES would provide an important service by calculating both an inflation index and an interstate price index to facilitate

While policymakers would welcome an expansion of NCES's data collection efforts, they understand that resources are limited...

comparisons of the cost of education over time and across states. While some information is available on both topics, policymakers apparently feel uncomfortable with it. Given the importance of comparison, it is critical that these indices be as accurate as possible.

NCES has been working with some of these issues for many years. For example, the agency has sponsored work to develop interstate and intrastate cost adjustments, with new findings expected by the year's end. Periodically, NCES provides information about teachers, including salary levels. The Common Core of Data (CCD) provides extensive information about school districts. The agency needs to find ways to improve the dissemination of this information, so policymakers are aware of the work completed and under way.

Conclusion

NCES collects, organizes, analyzes, and disseminates a tremendous amount of information, much of which is relevant to policymakers who are interested in, and concerned about, school finance. There are a few ways the agency could increase the utility of data to policymakers, particularly given their perception that they need more information to make better decisions. In particular, policymakers have a great deal of interest in having access to a few types of comparative data that are accurate and timely. Policymakers also tend to focus on particular issues that change over time, for which targeted data are useful to inform the discussion of policy alternatives. While policymakers would welcome an expansion of NCES's data collection efforts, they understand that resources are limited, which might require the agency to find ways to improve the efficiency of its data collection efforts, even if this means collecting fewer data or collecting them less often.

Issues and Data Needs in School Finance

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Selected
Papers in
School
Finance

Issues and Data Needs in School Finance

Issues and Data Needs in School Finance[1]

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Education policymakers are increasingly interested in the results of education. More and more policies, at all levels of government, are focused on student outcomes. Other aspects of education policy and practice, such as the resources used to support education, are increasingly viewed in terms of how they contribute to achievement. Today, policymakers are less interested in thinking or learning about—or the disparities in—resources and isolation, but are more concerned with how resources link to practice and achievement.

This paper focuses on the implications of current and emerging policy issues for school finance data. The words "school finance data" are broadly used terms implying not just fiscal data but other data about schooling that are useful to policymakers interested in school finance. Little space is devoted to determining how these data are best collected or other technical issues, such as what data might be collected on a sample basis and what data should be universal. The focus, instead, is on the kinds of data that would be useful for policymaking decisions.

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Policy Trends In the 1990s

During the early 1990s, policymaking activity has shown three major trends. The first is a movement toward the development of standards for student learning and related policies, an approach known as systemic reform. The second is a change to accountability that focuses more on results or schooling outcomes. The third is an effort to relate finance decisions and issues to the focus on standards and outcomes reflected in the first two trends.

Systemic School Reform

Systemic school reform has become so widespread that it is increasingly difficult to specify its meaning. It can mean different things to different people. However, it is possible to identify a few central themes that currently permeate much of educational policy at various levels of government.

Standards

The major theme of systemic school reform is the development of challenging

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expectations for student learning in key subjects. In the past, most states and districts specified expectations through course requirements for graduation and regulations about minimum times to be spent on different subjects. Where policy did specify outcomes, it typically was expressed as vague statements of competencies and was not very ambitious. Few states or districts explicitly detailed substantive standards expressing what students should know and be able to do. In fact, policymakers avoided specification of outcome expectations. In our increasingly diverse society, there are many differences of opinion about what should constitute a core curriculum learned by all students. Deep conflicts over the purposes of education have made policymakers wary of opening goal discussions (Tyack 1976, 1992).

The movement to establish explicit outcomes is in part a reflection of professional leadership. The National Council of Teachers of Mathematics (NCTM) was the first disciplinary association to develop subject-matter content standards. The organization decided to develop and establish curriculum standards to encourage textbook publishers and test developers to produce more rigorous, challenging material. Now, disciplinary associations in all the core subjects specified by the U.S. Department of Education's National Goals for Education (1990) are seeking similar consensus.

The movement toward standards also draws energy from international comparisons. Many of the nations that outscore the United States on international assessments have educational systems organized around explicit content expectations (Cohen and Spillane 1993).

Leading states, such as California, began to emphasize the importance of curriculum frameworks defining challenging expectations for students. During Bill Honig's term as superintendent of public instruction, the frameworks became not only the foundation for textbook adoption, but also the core of the state's student assessment program, staff development, accountability, and teacher certification (Massell and Fuhrman 1994).

Currently, teams of educators and representatives of the public in more than 30 states have initiated development of new curriculum frameworks in various subject areas, joining 15 other states that have already implemented them (Pechman and Laguarda 1993). Even traditionally strong local-control states like New Jersey, Vermont, Massachusetts, and Minnesota are developing curriculum frameworks (Massell and Fuhrman 1994). As an initial step, many districts also are undertaking standards-based reform and creating curriculum frameworks, generally in coordination with the state frameworks where one exists (U.S. Government Accounting Office 1993).

Integrated Policies

Systemic reform implies policy coherence. The general notion is that policies should integrate and send consistent signals. This aspect of reform reflects significant frustration with policy. Because of our multilevel, multifactor system for governing education; the need to claim electoral credit through initiatives that are deliberately crafted to be distinctive; the increasing volume of policy from all levels of government; and related trends to specialize policy institutions, policy has been marked by fragmentation.

Education policy is characterized by contradiction and ambiguity. For example, most teacher certification and evaluation requirements stress generic skills, not ability to teach the subject matter students must master. Programs for students with special needs are removed from the mainstream curriculum, fragmenting not only their education, but the work of teachers and administrators. Staff development frequently consists of one-shot workshops on hot topics unrelated to one another or to the fundamental instructional and pedagogical issues that teachers face daily (Fuhrman 1993).

To improve the level of policy coherence, states are beginning to use their emerging student outcome standards as anchors for other policies that would coordinate with and reinforce these standards. Key policies being integrated include those directly linked to curriculum: instructional materials, student assessment, teacher certification, and teacher professional development (Smith and O'Day 1991). States with textbook adoption policies are using them to assure that materials address the new expectations for student learning, and many are developing criterion-referenced tests linked to standards. Arizona, for example, moved from norm-to criterion-referenced examinations in all state-required subjects and incorporated more open-ended items requiring complex thinking (Massell and Fuhrman 1994). A survey conducted during the 1991–1992 school year revealed that 28 states were implementing, and 6 more were designing or piloting, some form of alternative assessment (Pechman 1992).

The movement to assure that teachers are prepared to teach the knowledge and skills expected of students is a bit slower, but still noticeable. Oklahoma, for instance, decided to tie teacher certification to standards developed by the National Board for Professional Teaching Standards. States like Vermont and Kentucky are urging teacher-education institutions to focus more on results and on preparing teachers to teach according to the new standards (Massell and Fuhrman 1994).

Just how many policies must be integrated and linked to these standards is an issue of some difference among states. One of the meanings of systemic reform is the notion of working on the whole system, including preschool education and school-to-work and child welfare and safety issues. States vary in the extent to which they are addressing all of these issues simultaneously and the extent to which they are making priorities. Some, like Delaware, are focusing primarily on instructional reform of elementary and secondary education. Others, like Kentucky, have included a school-level social service provision in their overall reform efforts and are proceeding on that front as they address others. Despite the variation, it is important to note that the theme of policy coordination includes the notion of bringing more policies, including some that are not traditionally thought of as education policies, to bear on the improvement of schooling.

Dramatic Improvements in Teaching and Learning

Standards and related policies are, for many reformers, the means to an ultimate goal: much improved teaching and learning. The vision that drives reform is more active learning, with teachers coaching students to engage in more problem solving, critical thinking, and analysis. To accomplish this, the curriculum must be made more challenging and relevant. Teachers must change the way they teach, taking more responsibility for student learning and encouraging students to do the same. Students and parents must place more value on intellectual accomplishment. Schools and communities must find ways to organize work to support these changes in teaching and learning, and participants in schooling must have the discretion and the resources to make these changes in ways that are best suited to local situations (Fuhrman and O'Day 1994).

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Standards and related policies are intended to support these classroom and school-level changes. They provide direction—common, challenging expectations for all students and schools—that encourages schools to aim high. Coordinating various policies with standards reinforces the direction and lessens the possibility that inconsis-

The current movement toward systemic reform reinforces and lends momentum to the trend toward performance-based accountability.

tent policies and programs will divert attention and energy (Fuhrman and O'Day 1994).

Most states, then, are establishing ambitious expectations for student learning and aligning various policies with the standards. Many districts, including large cities like Chicago and New York, are setting their own content standards. As the NCTM standards illustrate, at the heart of many of the standards efforts is a new vision of teaching and learning that moves away from basic skills, fact-based instruction, and teacher-centered pedagogy. The instructional changes will need to be made at the school level, with standards and other policies providing direction and consistent support.

The Clinton administration's strong support of systemic reform should give the state- and district-level movement even greater impetus. Not only is the Department of Education supporting the development of voluntary national standards that could be used as models by states, but the Goals 2000 program will also provide grants to states and districts for standards-based reforms. Further, the Elementary and Secondary Education Act (ESEA) Reauthorization proposal would integrate Title I and other federal special need programs with these reforms. So that all children, including those served by categorical programs, could be held to the same high expectations as other students, states and districts would need to establish standards for participation in these programs, and they would have to use assessments linked to the standards to judge the children's progress.

Accountability Focused on School Results

Closely related to the establishment of standards is the refocusing of accountability programs on student performance. This trend was evident as early as the mid-1980s. As more states added performance measures to compliance measures as indicators used for the periodic accreditation or certification of districts; more began public reporting of student achievement and attainment; and more developed rewards and sanctions to be tied to performance (Fuhrman 1989).

The current movement toward systemic reform reinforces and lends momentum to the trend toward performance-based accountability. Standards provide a consensual, societal expression of desired performance, and assessments linked to the standards furnish more legitimate measures of performance for accountability than for standardized testing.

Two aspects of the accountability movement deserve comment in the context of finance data: (1) the expressed desire of states to simultaneously remove much of the existing input and process regulation currently on the books and (2) the increasing use of the school as the unit of accountability.

Outcome Accountability and Process Deregulation

Ever since Lamar Alexander, then-governor of Tennessee and chairman of the National Governors' Association, conceptualized the notion of a "horse trade," political rhetoric has focused on the notion of deregulating schools in return for adequate performance (National Governors' Association 1986). Schools agreeing to be accountable for appropriate progress in student achievement would be freed from practice restrictions.

Policymakers first broached the idea of the "horse trade" in a cautious, limited manner. They restricted eligibility to schools that were consistently performing, such as those in South Carolina's Flexibility Through Deregulation program, or to schools that were successful in a proposal/project grant process to support innovation through waivers, such as in Washington's Schools for the Twenty-First Century program or Texas' Partnership School program (Fuhrman and Elmore 1992). Typically, states also limited the rules deemed waivable. The fact that few schools and districts took advantage of the waivers in these initial programs reflected the importance of tradition in limiting innovation that conflicted with the rules, the possibility that rules were so rarely enforced that entrepreneurial educators had always found ways to circumvent them, and the utility of state mandates to local districts, which use them to generate taxpayer support. The relative lack of interest in waivers also reflected the cautious design of the waiver offers. Schools that were already successful found little reason to request relief from the rules; the real test will occur when deregulation is broadened to include less successful schools (Fuhrman 1989; Fuhrman and Elmore 1992; Elmore and Fuhrman 1995).

States are currently trying to broaden deregulation in a number of ways. Some are exempting participating schools from virtually all rules through chartering procedures, and many are moving toward removal of rules for all schools and districts as they fortify performance-based accountability systems. States such as Tennessee, Arkansas, and Kansas have eliminated or plan to eliminate ("sunset" or repeal) many regulations as their new assessments come on-line and as accountability becomes increasingly anchored on results.

However, the movement to broaden regulatory flexibility beyond a few trustworthy districts is encountering several obstacles. First, because new assessments are still under development in many places, there may be no outcome measures upon which to rely. As a result, policymakers may, for example, wish to eliminate requirements that schools offer a set amount of science or social studies, but they will be reluctant to do so if state assessments are made only in mathematics and language arts and if there are no comparable measures of science and social studies outcomes (as is the case in many states). In relation, it is hard to rely on brand-new assessments—perhaps with some unresolved questions about their reliability and validity—to the extent necessary to make policymakers feel safe in removing other minimal-quality requirements. Parenthetically, and unfortunately, the hesitancy to attach consequences to new assessments is not as widespread as educators might like it to be. There is danger that the whole reform movement will falter in the rush to the stakes because educators and the public will resent the fact that schools and students are not given sufficient opportunity to learn the new standards.

The question of opportunity to learn brings up a second major reason why it is difficult to remove regulations. Regulations were implemented as protections, frequently for particularly needy constituencies but also to assure minimum levels of service across districts of varying wealth and capacity. As a result, states may have class-size requirements for special education, for example, or targeted-service rules for compensatory education; and for the entire school population, states may have minimum numbers of minutes of instruction in subjects, teacher assignment rules, and minimum course offerings. States historically have seen protection of students and assurance of minimum quality as the cornerstones of their role in education; they are hard-pressed to abandon input and process regulations designed to guarantee equitable services (Elmore and Fuhrman 1994).

Further, as we move toward more performance accountability and more sophisticated performance measures, the fear that not all students will have equal opportunity arises. Policymakers are facing an enormous *Catch 22* situation. They believe that more ambitious outcome goals will challenge the creativity of schools and that schools will need flexibility in staffing, scheduling, and other aspects of organizing teaching and learning. They are trying to remove input and process restrictions so that schools are free to tailor instruction to meet the increased

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outcome expectations. At the same time, states want to be sure that students get the instructional services they need to meet the new, ambitious goals (O'Day and Smith 1993, Darling-Hammond 1992). By tradition and experience, they typically know of no other way to assure those services in districts of vastly uneven resources and capacity than to mandate them by retaining or reimposing the same input and process restrictions they know they should remove. Techniques for monitoring teaching practice through indicators that do not regulate are sorely needed (Elmore and Fuhrman 1994; Porter 1994).

A third obstacle to regulation removal is that policymakers worry about habitually noncompliant districts, those frequently termed "bad apples." They are very reluctant to remove regulations for places where concerns about patronage, nepotism, and generalized corruption exist (Dolan 1992; Braun 1993; Fry, Fuhrman, and Elmore 1992). The question of what to do with such districts is one of the most perplexing and troublesome state policy problems. Policymakers typically set regulations for the whole state with these troubled places in mind. This mindset goes a long way toward explaining why education codes are lengthy and frequently practice-restrictive. When it comes to removing regulations, policymakers are wary of exempting such places, but may not know how to single them out for special treatment. To include them in a category of low-performing districts still to be regulated means applying regulations to many noncorrupt and compliant but low-achieving districts that otherwise might have taken advantage of deregulation to improve. To put them in a separate category of miscreants typically requires court action and lengthy documentation; one way of avoiding all this is to keep tight restrictions on everyone.

A fourth problem in removing regulations is politics. Regulations protect not only students but also powerful constituencies, such as categorical program providers and specialty teachers.

Fifth and finally, even if all the regulations on the books were removed, policymakers might not achieve their ideal of freeing schools from restrictions so they can focus on performance. Factors besides regulation constrain. These include union provisions, local policies, and traditions and norms. They also include finance formulas. Some states have formulas that mandate class size and organizational patterns; these seriously limit the amount of flexibility that can be achieved through deregulation.

Increasing Focus on the School

As states began to develop performance-based accountability approaches, they increasingly began to zero in on the school as the focus of reporting, accrediting, and any rewards and sanctions that might apply. Accordingly, report cards increasingly featured school-level data about achievement and attainment; accreditation more often had school-level components making district certification hinge, to an extent, on individual school performance, as well as average district performance; monetary rewards often were tied to school, as opposed to district-level, gains; and interventions often were more likely to center on individual schools, as well as on whole districts, that were troubled.

The focus on the school can be traced back to the effective-schools movement's findings about the importance of school vision and its mission in determining achievement, as well as on the related contribution of school autonomy (Purkey and Smith 1983). Since the early 1980s, the school has been pictured as the unit of improvement by educators and researchers, and increasingly so in policy rhetoric. The school-level focus also reflects evolving notions of organizational restructuring for high performance.

Private-sector organizations under market pressure to improve dramatically have found that implementing the required changes requires flatter organizational structures. Goals and performance objectives are usually at the top of the organizational structure, but newly created multifunctional work teams design responses. The focus on the school, in the context of higher-level standards and support, is the education equivalent of this evolving organizational and management strategy, which becomes more popular the more active business leaders become in education reform.

Finally, the school-level focus reflects the failure of district-level interventions designed as remedies for low performance. Not surprisingly, a preoccupation with management characterizes most intervention/takeover operations because corruption or ineptitude make the districts at issue easily justifiable takeover targets. Although low achievement may have been the legal trigger for takeover, and although few states pay attention to the possible wasteful, profligate, or even illegal activities of high-performing districts, it is on the central office's deeds and misdeeds that the interventions have focused. Record books have been straightened out and personnel have been shifted around, but hardly any change has filtered down to the schools (Dolan 1992, Olmstead 1993). As a consequence, little has been done to rectify the problem of low student performance. Takeovers can run out of legal time without having any noticeable effect on school practice. Not surprisingly, states are continuing to seek alternatives to district takeovers in order to address the problem of school performance. For example, Kentucky's 1991 reform explicitly refocused state intervention activities on schools. Now the state has schools-in-crisis, as well as districts-in-crisis and Kentucky Distinguished Educators programs intended to provide technical assistance.

Thus, accountability focused on performance has meant increased attention on outcomes, a struggle by policymakers to be less prescriptive about inputs and practice, and a new focus on the school. These trends reinforce and interact with the standards-based reforms discussed earlier to mean more policy focus on schooling results.

Policymakers are increasingly interested in linking resources and performance.

Links Between Performance and Resources

Policymakers are increasingly interested in linking resources and performance. As more attention is paid to expectations for learning, other aspects of schooling, including resources, are increasingly likely to be joined to results in policy discussion. Further, signs of desperation, such as Michigan's elimination of the property tax for schooling without having an alternative in place, indicate that policymakers are reaching the end of their tolerance for ever-increasing expenditures. As pressures to spend for other social services mount, policymakers are increasingly anxious about continuing large increments in educational funding while achievement remains stable and disappointing. Policymakers are becoming more interested than ever before in how resources relate to achievement. A number of developments illustrate this trend: the links to outcomes and programs in school finance litigation and resulting remedies, a new interest in fashioning school finance formulas in ways that promote substantive policy goals, and a move to privatize elements of schooling.

School Finance Court Cases and Remedies

A focus on results is evident, both in recent school finance litigation and in the remedies that states are pursuing. In some court cases, specific outcomes are cited as evidence of the effects of unconstitutional finance systems; other court cases refer primarily to programs that are expected to

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influence the outcomes. As to the remedies, policymakers are increasingly using court cases as occasions for instituting substantive reforms that speak directly to improving performance.

Rose v. Council for Better Education (1990) in Kentucky is probably the best known case to rely on outcome evidence. The Supreme Court considered the state's ranking both in the South and nationally to decide that the state's education system was inadequate. It also compared test scores among districts of varying wealth and cited expert testimony linking achievement and resources. In 1993, Alabama's Supreme Court concluded that lack of student success in graduating and in postsecondary endeavors reflected badly on the state's education system and declared it inadequate as a result. In Montana, Texas, and New Jersey, court cases have focused on wealth-related disparities in programs and offerings among districts and their expected relationship to student performance, not on revenues or expenditures in isolation. This adequacy focus is quite a change from the first round of court cases in the 1970s and early 1980s. Earlier school finance cases centered on equitable funding, and systems were invalidated based on the degree of wealth neutrality, not on the degree of preparation afforded students.

The responses of legislatures similarly have focused on practice and improvement of outcomes. In Kentucky, Massachusetts, and Alabama, the courts left no choice, prescribing new education systems designed to improve performance. In Alabama, the court went so far as to specify the elements of a performance-based system using standards for student learning as the basis for assessment, teacher development, and accountability. Even in states where the court did not stress the need for substantive policy reform, the legislature took the opportunity of a court case to embark on such reform. In Missouri, school funding revision was included in a systemic reform legislative package, and in Texas, various attempts to meet the court-funding mandate were accompanied by policy reform proposals. In Michigan, where school finance revision was prompted not by court decision but by legislative action to repeal the property tax for school purposes, each government proposal for substitute funding has included such substantive reform components as charter schools and longer instruction days.

Clearly, both courts and policymakers are resolving the recurrent argument over whether dollars relate to achievement in the affirmative. They are deciding that money is important and that districts and schools—and in some cases whole states—that underspend are unable to provide students with the knowledge and skills they will need to survive in an increasingly complex economy. But their actions indicate a belief that it is not simply the amount of money that is important but also how that money is spent. They are insisting on substantive reforms—frequently standards and related policies, but often early childhood programs and special programs for at-risk students as well—that they believe will channel resources toward improved student performance.

Promoting Policy Goals by Finance Formula

Not only are courts and legislatures tying finance reform to policy change, they also are beginning to think about how to achieve this link directly through finance formulas. To some extent, discussion about revising formulas to create incentives for policy goals is still talk largely confined to policy experts and analysts (Odden 1994; Odden 1993). Although academics might suggest that states funnel money directly to schools—not districts, because the school is the unit responsible for achievement—no state has yet made such a move. However, at least three developments indicate the beginning of a movement away from the entitlement concept of school finance formulas and toward the idea of formulas that include provisions to promote policy goals.

First, at least two states are using formula aid to support professional development, a particularly important component of current reforms (Little 1993). As teachers grapple with the upgraded content and more complex pedagogy implied by challenging student standards, the need for investment in professional development becomes clear. Many teachers lack sufficient subject-matter preparation; most have little familiarity with teaching approaches that ask them to facilitate learning rather than transfer content. However, staff development frequently is seen as an "extra" not meriting support in tight fiscal circumstances. As a separate budget item, professional development is very vulnerable to cuts. Recently, Minnesota and Missouri directed that a portion of school funding be set aside for staff development, indicating that political realities are shifting and that states are more willing to push policy goals directly through the general state aid formula.

Second, a number of states have instituted or are planning to institute monetary rewards for achievement. A portion of state aid would go to all schools and districts, and a portion, not an insubstantial amount, would be reserved for schools that do particularly well in improving performance. Although states have had reward programs in the past, they were never very popular. Only a handful of states generally had such programs at any one time, and the rewards were typically small, so marginal and viewed as so ephemeral by school staff that they were used for one-time purchases and materials rather than for recurring costs (Richards and Shujaa 1990). In contrast, Kentucky schools stand to gain substantial increments for increasing achievement, and several other states are thinking about emulating Kentucky's program, thanks in large measure to The Business Roundtable, an association of chief executive officers who promoted this concept in a number of locations (The Business Roundtable 1993). Further, some states and localities are interested in the notion of "gain sharing", whereby schools that improve could keep money saved, as well as become eligible for additional funding.

Third, some states where reform is taking place are starting to examine the role of the school finance formula in constraining school behavior. For example, some policymakers in Delaware, which has a finance formula based on shares of teacher salaries and other staffing ratios, are planning to examine the formula in light of the state's New Directions reforms, which promote ambitious outcome expectations and stress streamlining of practice impediments. It is likely that a number of states will, at some point, consider whether finance formulas need to be redesigned so that they do not restrict school behavior.

Privatization

One way to assure a link between resources and performance is to enter into a contracting arrangement with school providers; schools would receive funds only to the extent that they performed. The system is currently replete with performance contracts to private firms for noninstructional services, such as maintenance, transportation, and energy control. Recently, there have been a number of efforts to extend performance contracting to instruction. For example, Education Alternatives, Inc., runs a number of schools in Baltimore and in Dade County, Florida. Public Strategies, Inc., a private, for-profit consulting firm that has been chosen to lead the Minneapolis schools, has negotiated a contract that would tie its fee to student achievement (Richardson 1993). Finally, the growing interest in vouchers, as evidenced by Proposition 174 in California and debates in states as diverse as Michigan and New Jersey, indicates a willingness to privatize schooling by devolving funds and

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contracting authority to parents, who could then purchase performance from diverse providers.

In summary, courts, legislatures, and educators are increasingly seeing links between resources and achievement. They are joining school finance arguments and remedies with substantive reforms, considering ways to directly advance policy goals through the provision of school aid, and considering contracts that explicitly tie dollars to performance. In light of the overall emphasis on school performance, these trends have several implications for school finance data.

Implications for School Finance Data

If the interest of policymakers is to guide the types of scheduling data that should be collected, the most obvious implication of the above discussion is that we need better performance data. Policymakers will want to know how students are meeting the standards that are being established, and they will want that information to be as trustworthy as possible. For performance data to be legitimate, they will have to stem from reliable and valid measures that are respected as appropriate gauges of what schools are trying to achieve. Much current activity is directed toward designing assessments that provide legitimate measures of progress. But if, as this author argues, policymakers are interested not only in performance, but also in how other policies and resources link to performance, the data they will need should be much broader. It is likely that policymakers increasingly will want explanations of performance variation; therefore, they will be interested in a wide range of data about school-level conditions and practices that can be linked to performance.

School-Level Data

A clear implication of current policy trends is that policymakers want finance data about individual schools. Because schools are the units of production and increasingly the focus of policy, policymakers want to know how districts allocate money to schools, how schools allocate resources, and how those resource allocations link to performance. Performance and fiscal data will be needed at the school level, along with comprehensive data about students and staff.

Some might argue that a school-level accounting system makes little sense unless schools actually control resources. Odden (1993) recommends that states consider funding schools directly to promote both school authority and equity. As a less dramatic alternative, he recommends that states follow the lead of the United Kingdom and require that 85 to 90 percent of all dollars—general and categorical—now allocated to districts be sent to schools in a lump sum.

The issue of a school-level accounting system can be considered separately from the notion of school budgetary authority. As important as the latter may be, the fact that many jurisdictions are taking small steps toward school budgetary control without concomitant steps to establish a school data system suggests that one cannot assume that a data system will naturally follow devolution of authority. Furthermore, the idea of a school-level accounting system is much less politically charged than the idea of school-level funding; a school-level system could get under way relatively quickly if resources and training were provided.

School Resource Use and Practice Data

An important component of the data collected at the school level is information about the use of resources. Accommodating policymaker interest in relating resources to achievement requires better ways of measuring the resources devoted to encouraging learning. Data about practices that relate to achievement are enriched to the extent that expenditures for and costs of various practices are understood.

Object and function categories are not sufficient to show how resources really are allocated among programs; among subjects, such as mathematics and humanities; among grade levels; and perhaps among different types of instructional approaches and technologies. The need for sophisticated information about resource allocation interacts with current reforms, particularly the establishment of standards, in important ways. By providing clear direction, standards will form a substantive base for resource allocation decisions. A definition of effectiveness should be established against whether resources are being used effectively. With a shared vision of success and with assessments that measure what schools are actually trying to achieve, school practices can be linked to achievement, and schools legitimately can be compared to determine what practices lead to success. It will be helpful to compare the resource allocation patterns of schools that make differential progress, although this will require better data about school spending than are currently available.

One reason for comparing resources is to judge the degree to which students in various schools have equal access to necessary services. Much current finance policy debate focuses on the notions of program equity and adequacy. As previously noted, courts and policymakers are moving from definitions of equity that rest on dollars to definitions of equity that rest on practices that can be linked to achievement. Many hope that at some point, it will be possible to cost out the set of practices that constitute an equitable and adequate program, especially when standards are available as the basis for determining program effectiveness (Clune 1993). For example, standards will enable specification of what good preparation for teachers means and what laboratory or other special facilities may be necessary. These resources then can be compared across schools in varied circumstances and translated into dollars. The movement toward program equity rests on better information about resource use. It also requires better understanding of the cost effectiveness of varied practices and instructional approaches, but without better accounting systems, cost-benefit analyses are difficult, if not impossible, to conduct.

Good data about resource allocation might enable much more thoughtful and meaningful intervention in troubled schools. If state personnel and other technical assistants could draw on knowledge about resource allocation in successful schools to help low performers, their interventions would be much more useful than most current strategies. Right now, programs for troubled schools define both management and achievement as problem areas but have failed to find ways of improving the links between management and classroom success.

Good data about resource allocation might enable much more thoughtful and meaningful intervention in troubled schools.

Two dilemmas arise in the design of a school-level accounting system that would provide disaggregated, meaningful data about school resource use. First, it would be a mistake to rectify the existing program structure by calling for program expenditures using today's definition of "program." For example, many states are hoping that compensatory and other categorical programs will serve whole-school improvement, much as is intended for Title I in the Clinton Administration's proposal for the reauthorization of ESEA. Further, the systemic reform strategy rests on the concept of coherence, on moving away from a program-by-program "projectitis" approach to education policy, and toward a more comprehensive vision of school improvement. Therefore, an accounting system should not contribute to the indefinite maintenance of separate program categories such as remedial education. Program categories should be sufficiently flexible so that they can be refined over a period of time.

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The second dilemma is harder to address. Much of what is hoped for, much of what is encompassed by the dramatically improved vision of teaching and learning that lies at the heart of current reforms, will not come from manipulating easily measured resources such as staffing ratios. Instead, the improvement will be in interactions between teachers and students. Better, richer instruction may not be reflected in resource allocation decisions. A promising approach to tapping changes in classroom practice (which then can be related to resource allocation patterns, on the one hand, and to student performance on the other) involves measuring the enacted curriculum. Porter et al. (1993) have used questionnaires to portray course content and pedagogy in mathematics and science. The questionnaires correlate strongly with more expensive measurement strategies—daily teacher logs, observations, and interviews, for example—and might be adopted for large-scale use, as are the background questions about practice associated with the National Assessment of Educational Progress (NAEP).

Finance Data on Reform Priorities

Although designing an accounting system that provides meaningful data on expenditures is a major challenge, a much less difficult task that might be used as an interim step is to collect finance data on reform priorities. For example, at the moment, nothing seems more vital to the success of reform than staff professional development, but very little is known about how much money is expended on professional development. Currently, districts provide data on budgeted amounts for adding extra days, purchasing workshops, or paying tuition for teachers' continuing education. It would be more important to know amounts spent on substitutes for release, common planning time by subject and by type of professional development, the amount of money spent on salary increments to reward continuing education, and the nature of the credits thus accumulated.

Another example of a reform priority is the use of more performance-based assessment. Common wisdom holds that new assessments will be costly and time consuming to develop, both in administration and in teacher scoring and verification. Unless data collection procedures are in place, such costs cannot be measured accurately and comprehensively.

Finally, because systemic reform implies comprehensive attention to the system surrounding schools, it will be important to collect data on programs that are increasingly allied to schools, such as school-linked services, early childhood care, and after-school efforts.

Data on Constraints on School Resource Decisions

If good data about resource use were developed, policymakers would then be interested in why schools spend the way they do and in the factors that affect variation in resource allocation. A number of factors serve as constraints limiting the ability of schools to reallocate their resources. Understanding how constraints imposed by school finance formulas, union contracts, policies, and regulations, for example, influence spending decisions probably requires research at selected sites. Nonetheless, data about certain kinds of constraints, such as district and state class-size limits or formula-based staffing ratios, could easily be collected and compared with data on spending decisions to aid in the interpretation of resource allocation patterns. It would be very useful for policymakers to know what school personnel think about the factors that place constraints on, and define parameters for, spending. Perhaps data about barriers are already being collected in efforts such as the Schools and Staffing Survey (SASS).

Because policymakers are trying, in fits and starts, to deregulate, but are finding that regulations are not all that limit innovation, information about perceived constraints should be helpful.

Related to the issue of constraints is an important caveat about any new data collection strategies designed to meet current reform priorities. New measures that themselves become practice-constraining should be developed. Very often, policymakers design indicators to obtain information without realizing that a set of indicators can quickly take on characteristics of regulation, even if no accountability or consequence is attached to these measures. For example, many experts now think that professional development should be an integral part of practice rather than being relegated to discrete chunks of time labeled for that purpose. When a state determines to measure the provision of professional development by "number of inservice days," however, districts tend to organize professional development around "days," perhaps only for reporting purposes (as in recalculating the time spent during normal school days), but quite likely as a sign that professional development is expected to come in day-long increments.

The difficulty of measuring important inputs and aspects of teaching without regulating them lies at the heart of the current debate over opportunity to learn. As previously mentioned, some educators are so concerned that setting ambitious outcome standards could disadvantage students in less well-off schools that they want to assure, in a relatively specific way, that all schools have certain resources and practices. Others are worried about flexibility and professional discretion coming into conflict with equity and are hoping to achieve opportunity to learn through a set of measures rather than rules (Elmore and Fuhrman 1995). The point is, that the line between a measure and a rule is a fine one that is easily crossed. Caution is warranted in developing measures to assure that they do not simply become more rules.

The point is, that the line between a measure and a rule is a fine one that is easily crossed.

Conclusion

As policy is increasingly focused on performance, policymakers are increasingly concerned about how resources link to performance. Policies to establish standards for student learning, to coordinate policies around these standards as support for improvements in teaching and learning, and to shift the focus of accountability to performance at the school level illustrate the growing emphasis on results. Recent court cases and resulting remedies, efforts to promote policy goals through finance formulas, and moves toward privatization illustrate the increasing tendency to link financing decisions to the new policy focus. These trends suggest that improved data about student performance, resource use and practice, reform priorities, and constraints on spending decisions are needed, and that, when possible, these types of data should be collected at the school level.

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A Call for Multiple Intrastate Studies

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William W. Cooley is Professor of Education at the University of Pittsburgh. He is Director of the Pennsylvania Educational Policy Studies at the Learning and Development Center (LRDC), Director of the APS Computer Laboratory in the School of Education, and Co-Coordinator of the Policy, Planning and Evaluation Studies degree program in the Department of Administrative and Policy Studies. He received his doctorate in educational research at Harvard University in 1958. He was Co-Director of LRDC from 1969–1977. Mr. Cooley has received several special recognitions, including selection as a Fellow at the Center for Advanced Study in the Behavioral Sciences in Palo Alto (1972–73) and election as President of the American Educational Research Association in 1982. His present research activities concern providing useful, relevant information to educational policymakers in Pennsylvania. He teaches courses in policy, planning, and evaluation research and computer applications in education.

Selected
Papers in
School
Finance

A Call for Multiple Intrastate Studies

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The National Center for Education Statistics (NCES) has determined that a new approach is necessary to "obtain policy analytic school finance data at the level of detail required to be informative." This paper is one of three conceptual essays prepared in response to that NCES request for new approaches. Its emphasis is on how and why several intrastate studies of critical school finance issues would be an important complement to the expansion of national data collection efforts.

The Dominant Policy Issues

Any consideration of data needs must begin with a clear statement of the purpose for collecting those data. If the purpose is to illuminate debates about school finance policy, then the policy issues to be debated must be specified. Some of the most critical policy issues today tend to be state-level issues related to the equity, adequacy, and efficiency of the educational system.

Most states today struggle with the difficult tasks of (1) making education funding more equitable from the perspective of both the student and the taxpayer and (2) making the schools more efficient and accountable to promote wise spending of scarce state resources. Policy debates include a wide range of issues: Will more spending produce higher student achievement? Is a large percentage of educational revenues not spent on education functions? If tax mileage rates are high in a district, why do its schools have much less to spend than schools in the affluent community across the river? Do schools have the necessary resources to adequately prepare students to become informed, employable, law-abiding citizens?

Some of the most critical policy issues today tend to be state-level issues related to the equity, adequacy, and efficiency of the educational system.

Each of these debates occurs in a particular state context. The 50 states vary widely in how they fund education, how much the state itself funds, how education is organized, and the condition of the state's economy. These many variations make it difficult to learn about the dominant policy issues by comparing specific variables across states. What is needed is a better understanding of how state finance systems work and how finance variables interact with important education variables, such as opportunity to learn, quality of teachers, availability of instructional resources, and student outcomes.

In an excellent discussion of the key school finance issues of this decade, Odden (1992) comes to similar conclusions. The primary question is not so much what data to collect, but what kinds of analyses might inform the current, pressing policy issues. This paper concludes that part of the answer must be multiple, intrastate studies of broad issues that relate to adequate and fair school funding methods.

To properly address the dominant policy issues, it is essential to have access to more than revenue and expenditure data.

To properly address the dominant policy issues, it is essential to have access to more than revenue and expenditure data. Data must include information about students (including achievement), district demographics, professional staff, curriculum, and special programs. It would be a long time before a national data base would have comparable data of sufficient breadth at the multiple levels necessary (for example, district and school levels) to inform such issues.

NCES could provide the leadership and support needed for such an effort. Further, the agency has, or has access to, the technical expertise needed to guide such studies. This expertise comprises the required conceptual models, data processing strategies, and analytical approaches that would be profitable to pursue. Because NCES has been working closely with the states to establish comparable variables, it also has a good start on building an inventory of the kinds of data rapidly available in various states. Let us now turn to a specific example of the type of study called for in this paper.

How Money Makes a Difference

An example of a study worth replicating within several states is Ferguson's (1991) analysis of how and why money makes a difference in raising student performance. Using data from about 900 school districts in Texas, he was able to show how differences in spending levels affect the quality of schooling and how this in turn affects student learning outcomes. This type of study gets at the heart of the debate over the relationship between educational inputs and student outcomes (for example, Hanushek 1989).

Ferguson was able to pull together into a single data base more than 40 variables which describe 900 Texas school districts. Included in this data base were measures of district demographics (20 variables), with some socioeconomic measures derived from the U.S. census; measures of student outcomes, such as reading test scores at sixth grade levels (10 variables); measures of the quality of teaching, such as teacher performance on a basic literacy test (7 variables); and measures of district expenditures as well as the property tax base per student (7 variables).

Applying a variety of analytic approaches in the analysis of these data, Ferguson was able to establish significant effect sizes for several variables that reflected the district's quality of teaching. His most important conclusion was that "hiring teachers with stronger literacy skills, hiring more teachers (when students per teacher exceed 18), retaining experienced teachers, and attracting more teachers with advanced training are all measures that produce higher test scores in exchange for more money" (Ferguson 1991, 484).

A replication of Ferguson's study would have quite a different purpose than do studies requiring national representation. In a schooling-effects replication, the concern shifts from a need to establish confidence in estimates of national or state education expenditures or student performance to a need to build confidence in models that explain how and why variation in expenditures produces variation in study outcomes. If Ferguson's results could be replicated in several states, it would have a discernible impact on educational efficiency, equity, and adequacy debates. It also would have important implications if the Texas results could not be replicated or if the results were to vary among states.

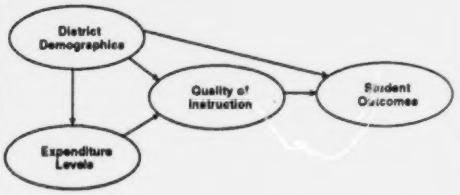
Within states, most of the variation in district expenditures is explained by how much each district pays its teachers and how many teachers it employs relative to the size of its enrollment. It is that simple. Districts that spend more per pupil tend to pay their teachers more and have more of them. It seems reasonable to assume that these two variables are somehow related to the quality of instruction in a district and that better instruction raises student achievement. If this is not the case, it is critical to understand why. It is also important to establish other ways in which high-and low-spending districts differ besides teacher salaries and pupils per teacher and to establish whether those differences are likely to affect educational opportunity and student outcomes.

Models, Constructs, and Measured Variables

Studies of how education finance variables seem to be influencing educational processes and outcomes must be guided by convincing conceptual models. Such models must include the major constructs needed to adequately model education systems and describe the dynamic relationships expected to be found among those constructs.

Figure 1 is a simplified version of the type of conceptual model that could guide replications of Ferguson's study. The major constructs are district demographics, expenditure levels, quality of instruction, and student outcomes. The arrows indicate probable directions of influence. For example, the socioeconomic characteristics of a school district are expected to directly influence expenditures, quality of instruction, and student outcomes. Expenditures, however, do not affect student outcomes directly. It is what expenditures buy that is important. If they buy better teachers and more of them, they enhance the quality of instruction. Better instruction produces better student outcomes.

Figure 1.—Example of a conceptual model.



This model helps to explain why studies that have attempted to directly connect expenditures to student outcomes tend to fail in finding such connections. It also makes clear that if socioeconomic variables are not used in the analysis, one could be attributing to quality of instruction which may be due to quality of the home. However, the purpose of introducing the model in this paper is not to defend it in detail; it is to illustrate how such models can guide multiple intrastate studies.

The main point is that the constructs in such models are considered unmeasured, latent variables. In the statistical study of the model, multiple indicators or measured variables represent each construct. Within a given analysis (or state, in this case), the variables must be measured in the same way for all districts or schools within that analysis. In one state, the percent of the district's school-age population in poverty homes could be one demographic construct variable, while in another state, it could be the percent of homes below the poverty level. The important thing is to have all constructs represented by a set of variables that are valid indicators of that construct.

For example, it is necessary to have student outcome information when analyzing such a model. Most states now use some type of statewide student assessment to measure outcomes (Barton and Coley 1994). These assessments are not comparable across states, but are comparable across districts and schools within states. If the state of Iowa administers the Iowa reading test and California administers the California reading test, and the tests have different test items, have different numbers of items, and are

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Variation in tax effort can be studied within states, but it is not a useful variable across states...

administered at different times, then the scores from these two tests should not be included in a single analysis of the relationships among input, process, and outcome variables. Either test could be an indicator of student performance in a structural model examining the relationships among input, process, and outcome variables within states. Mislevy (1992) provides an excellent discussion on the difficulty of trying to put different performance assessments on the same scale to make performance levels comparable. However, what is important in the type of analysis called for in this paper is that all districts in the state use the same test, which is the case in most states.

It is also likely that a state's student assessment system will be more consistent with the state's curriculum framework than will an externally imposed national assessment, thus improving the curriculum relevance of national tests. The National Assessment of Educational Progress (NAEP)—the only student assessment information currently available on nationally representative samples—is still far from being available for the district-and school-level analyses needed for the policy issues under discussion. Expanding the sampling framework to allow state comparisons and district and school level analyses would add millions of dollars to the cost of NAEP. Even if this were politically feasible, which is doubtful, in the end would be prohibitive. The report of the 1993 National Academy of Education panel chaired by Glaser and Linn provides useful insights into the problem of expanding the NAEP sampling framework to include state-level comparisons and the costs and benefits involved.

The dropout rate is another example of student outcomes that are difficult to compare across states. Another example of a student outcome variable that is difficult to compare across states is the dropout rate. States differ in how they collect and report student dropout data. To establish whether New York has a higher dropout rate than Alabama would require dropout data measured in the same manner. However, to see how dropout rates relate to other aspects of the education system within these two states, a dropout rate that is comparable within the state—comparable for the districts and schools within that state analysis—would be needed.

Similar arguments can be made about other measured variables as well. For example, local tax effort is an important variable in education finance debates. The variation in local tax effort within a state is indicative of the degree of taxpayer inequity and the level of tax effort—using appropriate statistical controls—can indicate local education commitment. However, comparing the local tax effort of a district in New Hampshire with that of a district in New Mexico is not, because of the differences in how those two states fund schools. More than 90 percent of district revenues in New Hampshire come from local taxes, but in New Mexico, the figure is less than 15 percent (Augenblick, Van de Water, and Fulton 1993, p. 30). Variation in tax effort can be studied within states, but it is not a useful variable across states at least not in the type of study being called for here.

The difficulty of obtaining comparable measures of average daily attendance (ADA) across states also has been well documented (Morgan 1991). The ADA is an important indicator of an education system's health and has been used in calculating allocations for federal programs, such as Chapter 1 and Impact Aid. Morgan (1991, p. 13) concludes that "because ADA collection and reporting procedures varied from state to state, it was difficult to make meaningful state comparisons." But ADA is an important school process variable that can and should be included in intrastate school finance studies.

A measured variable used in a given structural analysis must therefore have the same scaling properties for all units of observation within that analysis. For example, all variables describing school districts must be measured in the same way for all districts in that analysis. But in structural modeling, the variables used to indicate a construct need not be on the same scale for all replications of a test of that model. What is important across replications is that a given variable must be a reliable and valid indicator of the construct it represents and that all constructs in the model must be represented by a set of valid measured variables.

Responses to Change

Another subject worthy of multiple intrastate study is how districts respond to change. Two important aspects are changes in state funding strategies and changes in enrollment. Such studies would not require student outcome information but would best be accomplished by state-level analysis using convincing models of how districts would be expected to respond to change.

In the past few years, many states have made, and some have been forced by the courts to make, dramatic changes in how they fund public schools or in the level of funding. Multiple intrastate longitudinal studies of this phenomenon would be extremely informative as states struggle with policy issues related to such changes. How do districts respond when state funding levels increase faster than inflation? What are the rates of change in other state revenue categories and major expenditure categories? When state funding levels decrease, which has been happening in some states, how do districts respond?

These types of questions are quite different than those regarding how patterns of revenues and expenditures differ between wealthy and poor districts. Legislators want to know what districts tend to do when they get more money from the state. How do districts adjust other revenues, and do some expenditures tend to increase at faster rates than others? Legislators are asking such questions and answers are not presently available. A coordinated effort of multiple intrastate studies could generate answers.

Legislators want to know what districts tend to do when they get more money from the state.

Another type of change that has implications for state fiscal policy is change in enrollment. In most states, districts have experienced both enrollment decreases and increases. Such enrollment changes have resulted in reduced state funding where funding formulas are keyed to enrollment, although some districts with enrollment declines have nonetheless received additional state aid. A better understanding of how districts respond to changes in enrollment under various state policy environments should help clarify how states might deal with fiscal stresses and strains. National studies of state differences could be useful in guiding the design and clarifying the results of multiple intrastate studies. National studies have shown how states vary in major financial dimensions, such as expenditures per pupil, percent of expenditures that derive from different revenue sources, teacher salaries, and number of pupils per teacher. These state comparisons are useful in ensuring that states with different levels of funding, for example, are included in the analyses.

Using the state as the unit of analysis, national studies also have examined the relationships among such variables. However, relationships among states differ greatly from relationships within states. For example, variation in expenditures per pupil across states has become less dependent on variation in teacher salaries over the past decade (Augenblick, Van de Water, and Fulton 1993), but this may not be true within states. Multiple intrastate studies of such relationships can move us closer to understanding the dynamics of education funding

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than can studies using the state as the unit of analysis. Most of the important variations in school finance data occur within states.

How Firm a Foundation?

Another aspect of the current policy debates is education adequacy. This subject tends to be related to the general problem of defining the foundation funding level for state districts. The concern is the level of funding required in each district if the state is to meet its constitutional responsibility of ensuring a thorough and efficient public school system.

Intrastate studies could be designed to facilitate moving from some arbitrary or normative notions of base funding to a more substantiated basis for such levels. More needs to be learned about how foundation levels vary as a function of cost-of-living differences among state districts and how costs vary depending on the difficulty of the district's educational task, which in turn depends on the socioeconomic background of its students (see Cooley 1993 and 1994 for discussions of this issue).

Such studies also must be guided by models of these phenomena and will require student outcome measures to argue convincingly that funding levels are adequate or inadequate for acceptable student outcomes. The national goal of a 90 percent graduation rate is an example of such an acceptable level. What are the resources needed to move from the present 80 percent rate to that higher goal? The types of intrastate studies being called for here could help inform such debates.

Building a State Data Base

All states collect data about their school districts. Such data collections include information about district revenues and expenditures, the schools they operate, the professionals working in them, and the students they serve. These data are collected for purposes specified by state laws and regulations. They are usually collected by the state bureau responsible for the operations generating the data. For example, those responsible for teacher certification collect data related to teachers. Those responsible for conducting the statewide testing program collect data related to student performance. Those who are responsible for monitoring district finances collect data regarding district revenues and expenditures.

In this information age, most data collected by states are placed in a computer data base. Usually the bureaus responsible for particular domains produce reports summarizing their particular data: however, those data tend not to become part of a coherent relational data base, making it possible to examine the state education system as a whole, with the major components of that system represented by relevant data.

There are several reasons for this. One is lack of time and energy. Understaffed state bureaucracies are so burdened with collecting and organizing the mandated data that it is difficult to produce more than simple data summaries. Another problem is turf. Bureaucrats tend not to want to share their data, because their power is partly derived from their "ownership" of those data. A third problem is confidentiality— people's concern about invasion of privacy regarding computer data files. A fourth problem may be fear of compromise. State department officials do not want to see embarrassing results emanating from such data collections.

The approach to meeting the nation's school financial data needs advocated in this paper requires that we overcome the impediments to establishing an integrated data base. How this was recently accomplished in Pennsylvania may be instructive. Both political and technical tasks were easier than might have been expected.

In 1989, I approached Pennsylvania's Commissioner of Elementary and Secondary Education with an offer to implement my Pennsylvania Educational Policy Studies project indicating the types of policy-relevant studies that could be carried out if the Department were willing to share its data, and outlining how I would protect against invasion of privacy and potential embarrassment to the State Department of Education. The result was a memorandum from her office to all bureau chiefs authorizing that they share their data and stating the conditions under which this would be allowed.

The task was simplified by the fact that all bureaus used the same identifying codes for districts and schools, so that data from all domains could easily be linked. The only technical problem worth mentioning was moving the data from the state's IBM environment to the DEC computers at the University of Pittsburgh, but even that was easy once we figured out how to convert magnetic tape formats. In a matter of months we had a Pennsylvania State data base up and running. It included revenue and expenditure data for all districts, demographic data, professional personnel data, school data, and student data. The data were structured so that longitudinal or cross-sectional analyses could be made at the individual level, the school level, or the district level, using up to 10 years of trend data.

There are about 30 university-based education policy centers that could be enlisted to assist in this type of intrastate study. Some have established data bases similar to the one built for Pennsylvania. A next step might be for NCES to convene a meeting of the Policy Center Network (McCarthy 1990) to establish what capacities currently exist, as well as to determine the requirements for moving this notion forward.

Understanding Education Systems

A state school finance system is indeed a system, and it is the dynamic of the system, as well as how it interacts with classrooms, schools, and districts, that must be clarified. Even if comparable national data could be obtained, any analyses would have to be within the state because of the uniqueness of each state education system. As Odden (1990) pointed out so well, we need to better understand the relationships among school finance variables and other aspects of the education system. It is important to establish the stability of these relationships and to develop and test models that explain those relationships. We need to study how well those models fit data from states with different methods of funding schools.

...any analyses would have to be within the state because of the uniqueness of each state education system.

State financial accounting practices are thoroughly embedded in state laws and regulations controlling revenues and expenditures. With considerable effort and technical skill, NCES staff are now able to obtain comparable state-level financial data on some of the important variables. Yet, after all the cross-signals and imputations, tabulations comparing selected revenues and expenditures across states are the main result. These "E.D. tabs" (Fowler et al. 1993) are important, but they are not sufficient to resolve the nation's school finance data needs.

It is important to distinguish variables that are useful in state comparisons and the many variables needed for adequate modeling of the dynamic relationships among factors describing how revenue is produced, how it is spent, demographic contexts for taxing and spending, and the employability or educability of the students emerging from those systems.

...important issues in school finance are... at the state and local level—and, that is where [they] must be resolved.

Today, important issues in school finance are issues at the state and local level—and, that is where those issues must be resolved. Studies must be performed that have state and local policy implications; nationally representative studies are not likely to be the answer—at least not in this century. The state replications advocated here could be accomplished now; financial reform in schools is a national problem, but resolving the embedded policy issues is largely a state problem, and studying these state policy issues effectively requires a national, intrastate effort. I believe NCES is well positioned to stimulate such parallel intrastate studies.

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Estimating the Costs of an Educational Voucher System

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Levin has been a Fellow at the Center for Advanced Studies in the Behavioral Sciences, a Fullbright Professor at the University of Barcelona, and a Distinguished Visiting Professor at the University of Beijing. He is a past-president of the Evaluation Research Society and a winner of its Myrdal Prize. He served as a member and President of the Palo Alto School Board. He is the immediate past-editor (1991–94) of the *Review of Educational Research*. In 1991, the *New York Times* named Levin as one of nine "national standard-bearers" in educational innovation. In 1992, Levin received the Charles A. Dana Award for Pioneering Achievement in Education.

Levin is a specialist in the economics of education and human resources. His work is focused specifically on cost-effectiveness, educational finance, educational and workplace productivity, and investment strategies for educationally at-risk students. He has published 13 books and about 200 articles in scholarly journals.

Much of his recent work focuses on the establishment of accelerated schools to bring all students into the educational mainstream and make them academically able. Evaluation results show remarkable success at very low cost. In 1994–95, there were over 800 elementary and middle schools in 39 states pursuing the accelerated schools program.

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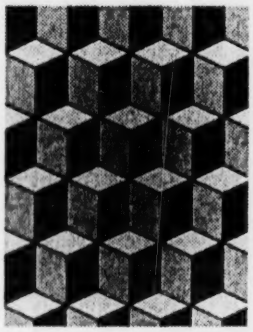

Estimating the Costs of an Educational Voucher System

Estimating the Costs of an Educational Voucher System[1]

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More than three decades ago, Milton Friedman proposed a radically different way of financing education (Friedman 1955, 1962). Parents would receive a government voucher that could be used for tuition at any approved school. Such schools would compete for students by offering programs that were designed to meet their needs and minimal standards for curriculum and any other requirements in order to be eligible to redeem the vouchers. Friedman argued that this voucher approach would create a more efficient schooling system by providing a wide range of choices to meet parental and student needs and by using vouchers as an incentive for schools to compete for students. Friedman also maintained that the use of vouchers would speed technological progress in education by building incentives for schools to gain a competitive edge in the marketplace.

The Friedman proposal was initially viewed as an academic novelty, unknown beyond university classes in public finance. The fact that Friedman's proposal was published at a time when states were using voucher-based schemes to avoid the U.S. Supreme Court's mandate for desegregation tended to undermine his argument that opportunities for African-American and poor students would be improved. However, the early education failures of the Johnson Administration's War on Poverty, as well as the failure to end school segregation in the North, stimulated a search for radical strategies for school reform in the late 1960s. Christopher Jencks (1966) proposed that vouchers be used to vastly improve education in urban ghettos, and Sizer (1967, 1969) called for an educational voucher plan for the poor. In a more skeptical light, Levin (1968) called for experiments with vouchers to ascertain their consequences. By 1969, the U.S. Office of Economic Opportunity (OEO) had initiated preparations for a voucher experiment, resulting in a plan to provide larger vouchers for poor children (Center for the Study of Public Policy 1970).

The OEO was unable to find a school district willing to accept the experiment in a state that would provide enabling legislation for private schools to receive public funds.

More than three decades ago, Milton Friedman proposed a radically different way of financing education.

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[1] This paper was prepared for presentation at the annual meeting of the American Educational Finance Association in Nashville, on March 18, 1994. It reports on part of a study that was prepared for the U.S. Department of Education, NCES. Comments are welcome and should be sent to the authors at CERAS 109, Stanford University, Stanford, CA 94305, where Dr. Levin is David Jacks Professor of Higher Education and Economics and Mr. Driver is a research assistant at the National Center for the Accelerated Schools Project. The authors are grateful for suggestions from Frank Kemerer, Dick Murnane, and John Witte.

Evaluation showed that, after 3 years, voucher recipients in private schools were performing no better than were similar students in public schools.

The result was a compromise in which the voucher experiment was reduced to a competition in San Jose, California, among public schools that had been reconfigured. Teachers at each participating school established three or four "minischools" at their school site, each with a unique education philosophy. Parents could choose any school or minischool within the Alum Rock School District. Although the experiment provided useful insights into public choice of schools, it was not adequate to test the impact of educational vouchers (Weiler 1974).

By the late 1970s the main proponents of vouchers were pushing for state legislation or state constitutional initiatives that would establish state voucher systems (Coons and Sugarman 1978). To some degree, their momentum was sidetracked by efforts to legislate an alternative to vouchers—tuition tax credits—that could reduce the tax liability of parents, by some portion, for tuition paid at private schools (James and Levin 1983). The failure to enact tuition tax credits and the publication of an important book advocating vouchers by Chubb and Moe (1990) restored this momentum. Chubb and Moe evaluated a large data set on high schools and found that students in schools with greater autonomy tended to have higher test scores. They concluded that the best way to increase school autonomy was a system of publicly financed scholarships (vouchers) that could be used in a competitive marketplace of public and private schools.

Although the statistical methods, conclusions, and interpretation of results by Chubb and Moe (1990) were challenged by critics (Witte 1992), the wide publicity given to their claims and recommendations generated a renewed interest in vouchers. In the early 1990s, constitutional initiatives to adopt the voucher approach were proposed and defeated in California, Colorado, and Oregon, but a fervor for public school reform and the growing effectiveness of political coalitions advocating vouchers augurs well for a continued push for vouchers among the states.

Although conflicting claims were made about the effects of educational markets generally, and educational vouchers specifically (Levin 1991a,b; West 1991a,b), there were few empirical data to validate either view (Witte 1992). Only in Milwaukee has a voucher plan been adopted for students from low-income families. Evaluation showed that, after 3 years, voucher recipients in private schools were performing no better than were similar students in public schools (Witte, Bailey, and Thorn 1993).

Regardless of its educational impact, a shift from the prevalent system of state financing and governance of education to one based on educational vouchers would require a profound transformation of institutions that support the schooling system. In California, for example, a shift to a voucher system would require state authorities to keep records and administer vouchers to nearly 6 million youngsters rather than deal with about 1,000 local school districts. To assure adequate access to alternatives, it is probable that information centers would be needed to enable parents to make informed choices and that an expanded system of publicly funded transportation would also be needed. In addition, a system of adjudication would need to be provided for parents wanting a partial refund of vouchers in order to change schools during the academic year. Finally, a state system of monitoring and assessment would be needed to establish voucher eligibility for both students and schools.

Although there has been much debate about the overall impact of educational vouchers on individual schools, considerably less attention has been devoted to the changes required for, and the cost implications of, a system to support the educational voucher framework.

The purpose of this report is to begin estimating the cost of the supportive framework for an educational voucher system. Creating accurate estimates requires the identification of categories for which a voucher system would entail additional or expanded state services or oversight and calculation of their costs. For reasons given in the next section, this effort can only be exploratory, not exhaustive. Therefore, it is important to stress that the purpose of this paper is to provoke discussion and to allow further refinement. In the following sections, we discuss issues that must be addressed in order to estimate the cost of a voucher system, with illustrative cost estimates.

Issues Affecting Voucher System Cost

The cost of replacing a system of schooling with a voucher system cannot be estimated without accurate specification of the particular voucher plan being considered and the system it would replace, the setting in which it would be applied, assumptions about the behavior of schools and families under the voucher approach, and the method of estimating costs. In this section, we review the importance of each of these concerns.

The Particular Plan

Although the educational voucher system is often referenced generically as though it were a single, unified approach to financing education, the term actually covers a wide variety of arrangements with varying potential consequences for cost. Proposed voucher systems vary from market approaches with little or no government intervention, other than the funding of vouchers, to highly regulated educational marketplaces with elaborate provisions for disseminating related information, transportation, school admission policies, and participation requirements. This variability suggests that they should be viewed not as either/or proposals, but as policy designs having different effects on cost—and on families and schools (Hoenack 1994).

Educational voucher plans differ in their regulations, information dissemination requirements, and systems of finance (Levin 1991a). The original Friedman proposal had few participation requirements for schools. This proposal made no provision for information dissemination and stipulated that parents would receive a flat amount for each child, which they could supplement. In contrast, the OEO proposal called for various admission restrictions, specific information from schools, an extensive system of related information that would be made available to parents, and vouchers tailored to students' needs, including larger voucher amounts for poor families. Parents would not be allowed to add to the allotted voucher. The Friedman proposal would not require elaborate systems of information dissemination, transportation, school monitoring, or evaluation of students. In contrast, the OEO plan would necessitate rather extensive outlays in all of these areas.

To provide even an approximate picture of costs for a supportive state framework for vouchers, it is necessary to know the specific details of the voucher plan. It is also crucial to know precisely what type of system the voucher plan would replace. Some states have very large numbers of local school districts, while others have relatively few. Some states have elaborate systems for monitoring and regulating schools, while others do not. In most states, oversight of private schools is less than might be required under a voucher plan. In other states, such as Minnesota, or local jurisdictions, such as 16 school districts in Massachusetts, parents have a wide variety of public education choices for their children. In those instances, at least some provision is made for disseminating school information to parents, although it is rarely extensive. Virtually all states provide some transportation for students who are distant from their schools

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or have severe handicaps. Because the cost of these services must be deducted from a particular voucher arrangement to receive the net cost for a voucher framework, it is necessary to know the characteristics of the public system it would replace.

In general, the costs of the framework for a voucher system would depend, in part, on the direction of such behavioral responses to new opportunities.

The Setting

The setting in which vouchers would be used will affect the system's cost. Some states have large numbers of students in private schools. In densely urban areas, transportation costs would be lower because (1) the market would offer many transportation choices and (2) because public transportation is widely available. The provision of information on alternatives might also benefit from economies of scale in these urban areas. In contrast, the cost of transportation might be considerably higher in rural areas because of the longer distances between schools. Monitoring schools, providing voucher-related information, and evaluating students for a voucher that meets their individual needs might also be more costly. Even in urban areas, population density and numbers of school-age children vary. For these reasons, it is necessary to know the specific setting in which a voucher plan would be implemented in order to estimate the cost of such a plan.

Behavioral Responses

In addition to the specifics of the voucher plan and the existing plan used, as well as the setting in which a voucher plan would be applied, the behavioral responses of households to a voucher plan must be determined. To the degree that a voucher approach would establish a new set of incentives and increase options for parents, one can expect that it would stimulate changes in both attendance patterns and school choice. As an example, Hoenack (1994) developed an econometric simulation to predict how voucher amounts of different sizes would affect the shift from public to parochial schools in Minnesota. In general, the costs of the framework for a voucher system would depend, in part, on the direction of such behavioral responses to new opportunities. What proportion of students would change schools (Lankford and Wyckoff 1992)? What proportion would require transportation to their new school? Would attendance be concentrated in particular neighborhoods and schools, or would the distribution be more random? How many schools would arise in response to the voucher system requirements of monitoring and approval? Would the residential mobility of households be affected by school choice and availability? What proportion of families would avail themselves of different types of voucher-related information services? The answers to such questions would be determined by how families responded to the opportunities and incentives inherent in a given voucher system, and how these responses would affect the cost of supporting that system.

Costing Method

Finally, the method of estimating the costs associated with a voucher approach will be one of the central determinants of whether implementing such a system is feasible. The method that should be used is straightforward. With the information stipulated above, it is possible to project the activities needed to provide a structure that meets government specifications for a voucher system. Based on parental choices, the number of children to be transported, as well as transportation patterns from particular neighborhoods to particular schools, may be calculated. The type of organization that would provide voucher-related information, the type of information this organization would collect, and how it would obtain and disseminate that information should be factored into the cost estimate, as should the types of monitoring activities required of schools, student evaluations required to allot vouchers, and the recordkeeping system required both for students and schools.

Each of these functions can be expressed in specific activities and services, and the resources or ingredients required to produce them can be identified. It is then possible to ascertain their prices and to estimate the cost of specific activities, as well as the cost of the overall voucher framework. This method has been used in education costing and meets standard methodological criteria (Hartman 1981, James 1983).

It is important to note that many of the costs estimated using the costing method discussed above might not be borne by the educational sector or government sources, but by households. For example, if provisions were not made for transportation, parents would have to make their own arrangements. Whether or not they were to use public transportation with its private costs and public subsidies, additional costs would be imposed. The same is true for information dissemination. If publicly funded information on school options were meager, some parents might choose to seek information independently from schools or private counselors. Indeed, the overall cost of these services might actually be greater. Therefore, it should not be assumed that restrictions of specific services offered by a voucher plan would limit its cost if the responsibility for obtaining those services were simply shifted to households. Both public and private costs must be taken into account when estimating the cost of supporting a voucher plan.

We assert that the cost of the infrastructure we consider necessary to support an educational voucher system would exceed the costs associated with the existing public school system. We believe that the information dissemination, transportation, and centralization of records required under a voucher system would entail added costs beyond what these services require in a more traditional schooling approach. To focus attention on and initiate discussion about such costs, we provide a ballpark cost approximation for each item under a given set of assumptions.

Although Lieberman (1993) argues correctly that published data are inadequate for comparing existing public and private education costs, his assertion that the cost of public schools exceeds the cost of a market system is based on assumption rather than on careful analysis and measurement. In an effort to clarify what the costs are, he lists many categories, with little attempt to define them carefully and show how they would differ between public and market systems. For example, in his catch-all approach, he lists the electoral process, operation of school boards, and education legislation as costs of public schools that would be eliminated under a market system (pp. 136-137). However, Encarnation (1983) has demonstrated that, far from eliminating legislation, government support of private entities historically leads to increased government intervention and regulatory oversight to protect the public interest. Further, school board elections and governance are hardly the dead weight loss asserted by Lieberman. Tyack and Hansot (1981) argue that public schools represent one of the few foci for democratic discourse, not only about education, but also about society itself. They assert that

> "...public schools are everywhere close at hand and open to all children. They generate valuable debates over matters of immediate concern and offer a potential for community purpose that is unparalleled in our society."

None of these arguments resolves the issues surrounding the relative cost of different systems, but they illustrate why these issues cannot be settled with polemics or tendentious checklists.

However, it is important to stress that even if costs are higher for a market system, this is not a prima facie criticism of vouch-

... the cost of the infrastructure we consider necessary to support an educational voucher system would exceed the costs associated with the existing public school system.

...we provide illustrative estimates of the costs of shifting to a voucher system.

ers. The real issue is whether any benefits of a voucher approach over the existing system would be justified by the additional cost or whether the additional cost for a supportive framework is offset by savings at the individual school level. This issue cannot be ascertained from the present analysis, but should be viewed as an open question.

Estimating Costs: Illustrative Costs in Five Areas

In this section, we provide illustrative estimates of the costs of shifting to a voucher system. These estimates are merely illustrative because we lack specifics on a particular voucher plan, what type of system it would replace, where it would be applied, and behavioral responses to the new arrangements. Without these ingredients, it is not possible to provide even an approximate cost for a state or smaller entity, nor a definitive comparison of current costs with those incurred through a voucher plan. However, it is possible to estimate costs for hypothetical situations that would be consistent with a shift to a voucher plan in order to provide the beginning of a dialogue on costs and to illustrate methods of obtaining costs. We address these costs in five areas: accommodating additional students, recordkeeping and school monitoring, transportation, information dissemination, and adjudication of disputes.

In each of these areas, we begin by discussing the issue and why it is central to a voucher plan. Next, we demonstrate how to measure costs for a particular area and provide illustrative costs, showing the degree to which some of these costs would be offset by cost reductions in the existing system. Finally, we suggest the magnitude of potential cost differences for the function.

Accommodating Additional Students

Under a voucher system, students who attend nonpublic schools would be eligible to receive publicly-funded vouchers. This means that, even in the absence of a shift from public to private schools or the provision of services to create an efficient system of choice, there would be an additional cost to the public sector, and a windfall gain for most families with children already in private schools. The amount of this public cost depends upon three factors: the number of students in nonpublic schools eligible to receive vouchers, the amount of the voucher, and the cost of attending those schools. The number of eligible students would depend on the regulations in voucher plans and the willingness of nonpublic schools to participate in the voucher system. With minimal regulations, it is likely that all or most schools would participate and be eligible. However, restrictions on admission policies, tuition charges, curriculum requirements, testing, etc., would limit the number of nonpublic schools willing to participate. For purposes of estimation, we will assume that under the least restrictive arrangement, 100 percent of existing students in nonpublic schools would be eligible to receive vouchers. We will assume a 75 percent rate of participation for estimating costs under the more regulated plans.

The amount of the voucher is obviously crucial in determining the additional public cost of accommodating students in nonpublic schools. The larger the voucher, the greater the cost. For purposes of estimation, we will assume that the maximum voucher amount would be equal in size to the average per-pupil expenditure in U.S. public schools in 1990–1991 (See Table 1).

The final criterion in estimating the cost of a voucher system is the amount of private school charges that would be eligible for voucher reimbursement. Although many private schools charge less than the average per-pupil public school expenditures, they hold fund-raising activities or require fees from parents. In addition, private schools often receive contributions in kind, such as

Table 1.— Total and per-pupil costs of K–12 public education: School year, 1990–91

Total cost	Cost per pupil in average daily attendance
$228.9 billion	$5,872

NOTE: Average daily attendance is the aggregate attendance of a school during a reporting period (normally a school year) divided by the number of days school is in session during this period as defined in the *Digest of Education Statistics, 1993.*

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993.*

...voucher costs might nevertheless be lower for nonpublic schools than for public schools...

donated or subsidized facilities and voluntary labor or staff who are willing to accept below-market wages because of a school's dire financial straits. However, we would expect schools eligible for vouchers to charge the full amount of the voucher. The additional school income would be used to improve staffing and salaries (Chambers 1987) and provide better facilities and services—that is, to raise the quality of the school. This tendency would be virtually certain in a market situation where schools and parents would have a strong incentive to use the full voucher.

However, voucher costs might nevertheless be lower for nonpublic schools than for public schools for three reasons. The first reason is that a voucher plan might provide a somewhat lower allocation for nonpublic schools because they need not meet the same public accountability requirements as public schools.

A second reason is that few private schools provide either special education services for the disabled or vocational services—two of the most expensive public school offerings. By federal law, public schools must provide education for all students in the least restrictive environment, and the cost of special education is nearly two-and-one-half times that for a "regular" student (Chaikind, Danielson, and Brauen 1993). The cost of vocational education is two to five times that of the academic curriculum at the high school level (Hu and Stromsdorfer 1979).

The third reason is that nonpublic schools have a higher proportion than do public schools of children at the elementary level where per-student costs are considerably lower than they are at the secondary level. Therefore, for purposes of estimation, we will assume that the minimum cost of voucher students in nonpublic schools would be 80 percent of the average per-pupil expenditure in public schools in 1990–1991. It should be noted that this lower cost per student is due to the fact that private schools enroll students with lower educational needs, it does not represent lower costs for students with equivalent educational needs. Thus, we are assuming no net savings for equivalent services when a student shifts from one sector to the other.

Table 1 provides total and per-pupil public school costs for the Nation[2] for the 1990–1991 school year from the *Digest of Education Statistics, 1993.*

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[2] One might also wish to look at other types of geographic areas, rather than for the Nation as a whole.

...each child required by law to be in school and those who continue their education through high school would need to be monitored with respect to enrollment and voucher provision.

Table 2.— Potential public education cost increases using vouchers equal to 100 percent, and to 80 percent of public school costs, under a voucher plan according to proportion of private school students participating (in 1990 dollars)

Percent of private school students participating	Cost using vouchers equal to 100% of public school costs	Cost using vouchers equal to 80% of public school costs
100 %	$27.4 billion	$22.0 billion
75 %	20.6 billion	16.5 billion

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1993.*

As seen in Table 1, the overall cost of nearly $230 billion breaks down to nearly $5,900 per student in average daily attendance. The *Digest of Education Statistics, 1993* (U.S. Department of Education 1993) also reveals that slightly more than 10 percent of all students attended private school that year—about 4.7 million of the total 46 million students enrolled in school.[3] Had all of the schools attended by the students in our model been eligible for vouchers, additional public costs for education would have been about $27.4 billion higher for school year 1990–1991. Had only 75 percent of these students attended schools participating in a voucher plan, additional costs would have been about $20.6 billion. Had the amount of the student's voucher been only 80 percent of the average per-pupil cost in the public sector in school year 1990–91, the cost would have been about $22 billion for all students, or about $16.5 billion at an eligibility rate of 75 percent.

Table 2 summarizes potential increases in public costs. Most of these costs would represent a shift from the private to the public sector (from present private school families to taxpayers), although some of these costs represent an overall increase in the social cost of education to the degree that overall expenditures on education would rise under a voucher plan.

Recordkeeping Systems

Voucher plans would require an elaborate system of recordkeeping by the state for three reasons: to assure that all children who are required to attend school are enrolled, to determine the appropriate voucher amount for each child based on educational need (such as grade level, disability, socioeconomic status, and language), and to assess the eligibility of schools to redeem vouchers. More specifically, each child required by law to be in school and those who continue their education through high school would need to be monitored with respect to enrollment and voucher provision. Such monitoring should be active rather than passive because of student mobility through changes in school selection and family mobility, as well as the normal shifts from one school level to another.

At the same time, children would be eligible for different educational services with appropriate differences in voucher amounts. For example, secondary schools have a higher cost than elementary schools, and services for disabled, educationally disadvantaged, and language minority students are more costly. Accordingly, students would have to be evaluated in terms of services required and voucher size. Finally, only schools meeting the regulations determined for participation in the voucher plan would be eligible to redeem their vouchers. Schools would then have to be evaluated, certified, and monitored for eligibility.

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[3] The 1993 *Digest* reveals that between 10 and 12 percent of school children typically attended private school during the period since 1964. Thus, the percentage of students attending private school in 1990–1991 is representative of attendance in the last three decades.

Currently, there is some cost to local educational agencies for recordkeeping and student evaluation, and some cost to the state for maintaining records on school programs. With voucher plans it is likely that these functions will be more extensive and complicated, given the need for more active monitoring, assessment and determinations. In addition, issuing vouchers, enforcing compulsory attendance laws, and regulating and monitoring schools would logically rise to a state agency rather than relying on local school districts to assure uniformity and consistency. Under the existing system, local school districts carry out many of these functions, including, complying with compulsory attendance laws, maintaining student records, and evaluating educational services. Because these functions can be integrated into a single agency that is close to the families and neighborhoods served, costs are likely to be lower than when they are handled by a centralized agency that is independent of the schools. Both the extensive nature and centralization of these functions will likely increase costs under voucher plans.

Accurate costs can only be determined once the specifics of a voucher plan are known. Without a specific voucher plan, we must instead look to analogous systems to get an estimate of potential costs. In this case, we examined the federal Social Security Administration (SSA), which maintains an ongoing record of eligibility of all 38 million SSA beneficiaries (U.S. Social Security Administration 1987). This system is partially comparable to a voucher plan, because SSA goes through essentially the same steps of any centralized office that determines initial and ongoing eligibility. Once initial benefits are determined—with higher processing costs for the more complicated disability claims—SSA then continues to distribute uninterrupted, equal monthly payments to beneficiaries. At different points in time, though, benefits may be adjusted to reflect changes in the situation of the individual or his or her family. This situation is analogous to a change in voucher amounts in a plan that allows vouchers of variable amounts.

We have chosen the SSA analogy because it describes a situation in which a relatively simple eligibility determination can be made, the retirement insurance case, and one in which eligibility requires a more complex determination (the disability insurance case.) This analogy parallels two voucher plan situations: one in which eligibility criteria are fairly simple, and one in which the eligibility criteria are more complex as a result of more variables. In the simple case of retirement claims, social security law requires determination of benefit payments based on a variety of formulae applied solely to earnings records of beneficiaries. This process is similar to a straightforward voucher plan in which the size of the voucher would depend on the school level in which the child is enrolled. The average annual processing costs for these claims in 1986 was $43 (in 1990 dollars) (U.S. Social Security Administration 1987).

In a more variable voucher plan where such factors as low-income status of families or special education needs provide for larger vouchers, the analogy of SSA retirement claims processing costs may actually be too low. A more complex voucher system would have ongoing processing costs similar to those of SSA disability claims processing, but probably less than the 1986 average of

... issuing vouchers, enforcing compulsory attendance laws, and regulating and monitoring schools would logically rise to a state agency rather than relying on local school districts to assure uniformity and consistency.

> ... there are likely to be far more schools to monitor under a voucher system—perhaps twice as many—if the size of private schools is an indicator of what will happen to school size under this type of plan.

$372, which included costly periodic medical evaluations (in 1990 dollars) (U.S. Social Security Administration 1987). Therefore, a likely amount for a voucher system may lie somewhere between the processing costs of ongoing retirement and disability claims, perhaps something like the amount shown in Table 3, which is the average of these two processing costs. The cost of $78 per claim is based on the heavy predominance of retirement claims over disability claims. However, to the degree that the overall budget of the SSA also includes routine maintenance of accounts prior to retirement or disability, some of that cost is attributable to other functions. Thus, a value somewhat below $78 per student per year would be comparable. Table 3 provides "ballpark" per pupil annual costs based on the SSA analogy. Here in Table 3, the simple (low cost) case assumes vouchers are all the same amount and that all schools and students participate in a given area; the complex case (high cost) assumes that voucher amounts vary.

Table 3 provides the approximate costs of a recordkeeping system, but they are not necessarily the net additional costs of recordkeeping a voucher system. To determine the net additional cost, we need to add the costs of the application process for new schools to certification and monitoring for existing schools for their eligibility to participate in a voucher system. We would then have to deduct from this total the costs expended on all of these functions (recordkeeping, evaluating services, and determining eligibility and monitoring schools) under the present system to determine whether these costs are actually greater under a given voucher system.

We have argued that the costs of the recordkeeping system are likely to be lower than they would be under a voucher plan because of the relative ease of gathering and monitoring information on a local level, with the integration of pupil information and the evaluation of educational needs provided by local educational agencies. Further, monitoring schools is far more routine than it would need to be in a dynamic marketplace of births, deaths, and changes in schools. Moreover, there are likely to be far more schools to monitor under a voucher system—perhaps twice as many—if the size of private schools is an indicator of what will happen to school size under this type of plan (Chambers 1981). For example, in 1987–88, over half of private schools with 4th grades and almost half of schools with 12th grades had less than 150 students enrolled, in contrast to 11 percent and 14 percent, respectively, of public schools at the same grade levels. In contrast, only about 8 percent of private schools with a 12th grade had 750 or more students enrolled, while almost 36 percent of such public schools were that large (U.S. Department of Education 1992).

The evidence seems to be overwhelming that the savings that would occur in reduced

Table 3.— Possible high and low average annual costs for a recordkeeping system in a voucher plan (in 1990 dollars)

Low Cost	High Cost
Less than $43 per student	$78 per student

NOTE: November 1993 U.S. Department of Labor Consumer Price Index (CPI) Detailed Report's "CPI-U" used to adjust the SSA amounts to 1990 dollars.

SOURCE: Social Security Administration, *Executive Handbook of Selected Data*, May 1987.

administration of the present system would be more than offset by the more extensive system required for regulating and monitoring schools and the investigative costs of assuring compliance with compulsory attendance laws as well as the centralization of that system. In that case, the higher cost of $78 per student per year might serve as a first approximation of the overall cost of recordkeeping and monitoring, and the lower cost of $43 per student from the SSA illustration might represent a first approximation for the net cost.

Transportation Costs

Any voucher plan that provides for meaningful school choice must include transportation. Although home schools and distance learning schools that use computers and interactive television might be eligible for vouchers if they met certain requirements, the vast majority of students eligible under a voucher plan would likely be found in school settings away from home. Because schooling must be produced and experienced in such settings, accessibility to a range of school sites would require adequate transportation.

Transportation costs would be a function of several factors, including the number of students being transported, the number of schools served and their locations, the geographic distributions of students and the schools they choose, and the costs of different modes of transportation. Other factors include, population density (rural students might have to travel farther to school and would be less likely to have access to adequate public transportation), climate, and labor costs. Transportation costs under a voucher system would probably be higher than under the present system, for two reasons: freedom to choose should lead to more students attending schools outside their immediate neighborhoods, and certain routes are likely to be lower in rider density and regularity.

We assume that a voucher plan would lead to a net increase in new schools because existing nonpublic schools are considerably smaller than their public counterparts. This larger number of schools would have both advantages and disadvantages for transportation. Increasing numbers of school choices would mean that students would have more school options closer to their homes, particularly in urban areas. But the current economies of scale—using larger buses with regular routes—would likely give way to the need for smaller vehicles with costly and irregular routing. Labor costs for drivers are similar for large and small vehicles, as are many maintenance and insurance costs. Assuming a further shift in student enrollment from nearby (perhaps formerly public) schools to other schools, both the number of students and the number of schools to which students need transportation would increase. Also, administrative costs would likely increase because more students and schools would be served. This would be particularly true if private schools continued to be considerably smaller than public schools, entailing a far larger number of schools—even beyond existing private schools—that would be added to the transportation system.

We assume that a voucher plan would lead to a net increase in new schools because existing nonpublic schools are considerably smaller than their public counterparts.

What do public school transportation costs look like? A 1987 study (Deloitte, Haskins, and Sells 1987) of data collected from 34 California districts that provided transportation service directly or subcontracted with private companies in school year 1985–86 provides ranges of per pupil transportation costs (see Table 4; costs given in 1990 dollars).

Table 4 shows that there is enormous variation in student transportation costs, even among those with relatively systematic and regular routes transporting both regular and special education children. In the 1986–87 school year, the national per-pupil average transportation cost was $292. By 1990–91, it had risen to $394 in 1990–91 dollars (U.S. Department of Education 1993). These costs

Table 4.— High and low per-pupil and per-mile costs (in 1990 dollars) of public school transportation in California: School year 1985–86

	Per-pupil cost	Per-mile cost
Low cost	$218	$0.72
High cost	3,782	3.90

SOURCE: Deloitte, Haskins, & Sells, *School Transportation Study*, 1987.

> Under a voucher plan..., the choice of schools would be decided by parents and students, and they might have less of an incentive to economize on transportation costs if they were paid by the government.

reflect benefits of economies of scale in districts that can establish regular routes and patterns of transportation among a fixed number of schools and with school assignment policies that can minimize the number of students bused and the distances they must travel. Under a voucher plan (within reasonable transportation boundaries), the choice of schools would be decided by parents and students, and they might have less of an incentive to economize on transportation costs if they were paid by the government.

The recent St. Louis school desegregation plan is somewhat analogous. Students from St. Louis were permitted to choose to attend schools in the suburbs, and those in the suburbs were permitted to choose to attend schools in St. Louis. The Missouri Department of Elementary and Secondary Education prepared calculations to show the total cost of transporting nearly 14,000 children among St. Louis and these communities; this cost was about $25 million, with a per-pupil cost of $1,800 in the 1992–1993 school year.[4] The reason for this seemingly high cost is the type of transportation provided: a combination of 1,100 traditional large school buses and 15 passenger van-style buses were used by the contracted bus companies, along with 80 to 90 taxis, on round trips ranging from only a few miles to about 80 miles. This combination might well be used under a voucher system.

School buses are not the only means of transporting children; in most regions, particularly urban and suburban areas, public transit is available at a seemingly low cost. In the San Francisco Bay area, for example, the Bay Area Rapid Transit (BART) system's average cost per mile for consumers in 1988–89 was about 11.6 cents per mile (in 1990 dollars) (Bay Area Rapid Transit District 1989).[5] However, this cost excludes the enormous subsidies that BART receives in such forms as local and state tax revenue and federal grants. Taking into account these other sources of revenues and their concomitant taxpayer expenditures, the average cost per mile increases from 11.6 to 49.5 cents. This higher figure represents a more accurate assessment of the costs of this public transit system, even if they are only partially borne by its users. Of course, the marginal cost of transporting an additional student is small, but for an entire voucher system, the student demands would be more massive than those at the margin, justifying the use of an average cost estimate.

Table 5 shows the annual cost of a 10-mile round trip (5 miles each way) on BART in 1990 dollars. It becomes apparent that

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[4] Tim Jones, Missouri Department of Education; personal communication with C.E. Driver, November 10, 1993.

[5] As cited in BART's annual report for 1988–89, the average trip length was 12.5 miles and the average fare was $1.38, with an average cost per mile of about 11 cents.

Table 5.— The cost of a 10-mile round trip on the Bay Area Rapid Transit System over a 180-day school year: 1988–89 (in 1990 dollars)

Fare paid	$209
Actual cost	892

SOURCE: Bay Area Rapid Transit District, 1989.

public transit has a low cost for patrons, though inclusion of subsidies substantially raises these costs. Nonetheless, public transit appears to be less costly than the more traditional bus service described above, assuming that public transit can serve school commuting routes within a reasonable commuting time. Of course, it is unlikely that parents would permit their elementary school children to use public transit without older children or adults acting as chaperones.

Of course, it is unlikely that parents would permit their elementary school children to use public transit without older children or adults acting as chaperones.

Depending on the number of new schools that would arise under a voucher system, its transportation systems might look more like those of St. Louis than do most systems we see today that only use large buses (except for those providing services for the disabled). In many large cities, private schools provide transportation at extra cost using minibuses or vans. These large buses likely would be replaced by more vans used to transport a fraction of the children who have chosen a given school.

An efficient transportation system primarily using vans currently serves the San Francisco Bay area's three airport facilities. Several companies offer very competitive door-to-airport service. Interviews with company staff suggested that a similar customized arrangement would work under a voucher plan if necessary. These interviews also elicited the per-pupil cost estimates under such a system given in Table 6.

Table 6.— Projected per-pupil 10-, 20-, and 40-mile daily and yearly transportation costs with "customized" service under a voucher system

	10-mile cost	20-mile cost	40-mile cost
Daily cost	$7	$10	$12
Yearly cost	1,260	1,800	2,160

SOURCE: Interviews with staff of the San Francisco Bay Porter Express and Express Shuttle bus companies.

What would be the magnitude of these cost differences? As noted above, the 1990–91 national per-pupil average transportation cost was $394; we estimated that the average cost under a voucher system would probably be well over $1,000. Even the most efficient customized transportation system would likely cost between $1,000 and $2,000 per student per year, with $1,500 being a reasonable figure, depending on the plan, setting, and school choice. The validity of this range is supported not only by the St. Louis busing data, but also by the $2,000 per student report for the Milwaukee voucher experiment.*

Not only would the average cost of transportation rise considerably under a voucher system, but the number of students requiring transportation also would rise, with important cost consequences. Nearly 60 percent of the students who attended public schools were bused in 1990–1991 (U.S. Department of Education 1993). Had this number been 80 percent of both public and private school students, an additional 11

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* John Witte; personal communication, with H.M. Levin, May 15, 1994.

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million students would have been bused at an additional cost of about $4 billion dollars, assuming the above-mentioned per-pupil cost of $394. However, had the cost per pupil been about $800 per year per student because of less economical routes, less expensive modes of transportation, and smaller schools, this higher cost per student, calculated to include the additional bused students, would have amounted to an additional $17 billion a year—about half of it attributable to the additional students and half to the higher cost. This figure is considerably lower than those derived from costs cited for St. Louis and other cities, or the projected costs of the use of vans.

The competitive efficiency of educational market systems depends greatly on consumer knowledge of alternatives.

Information Dissemination Costs

The competitive efficiency of educational market systems depends greatly on consumer knowledge of alternatives (Levin 1991a). Families of different racial, socioeconomic, and linguistic backgrounds would require equal access to information about the available schools and their own choices of schools. At a minimum, families would need to know that they have choices, the appropriateness of particular choices for their children, and the probable consequences of such choices. They would require details on such matters as a school's philosophy, curriculum, personnel, facilities, and test scores; the success rate of a school's placements after graduation; the nature and rate of complaints; and its student turnover rate. Schools would be required to provide such information to a central data system, and to establish a capacity for school visits and interviews by both parents and school staff.

Costs would be entailed for schools, parents, and government: for schools the costs include, collecting the appropriate data and making them available to parents and government agencies and providing for school visits and interviews; for parents, time and transportation needed to gather the data at both a central information agency and school sites as they narrow their choices; and for government, maintaining and updating a data base on schools and providing an efficient system for disseminating that information.

How can we project these information costs? One way to begin is to consider the steps involved in sharing that information. The first step is to specify, collect, and store the information. The second step is the actual sharing and dissemination of the information. In the first step, costs would increase according to the depth and quality of the information compiled, as well as the frequency of updating it. Consider, for example, cost differences between a one-time public notification that a voucher plan exists and a requirement that every school develop and publish an annual report in several different languages. In the second step, costs would depend on how much information needs to be shared, as well as how it is shared. Printed materials circulated through libraries, for example, should be less costly than information centers with specially trained staff. Nonetheless, a balance should be struck between the cost of sharing more information and its potential to improve decisionmaking by families.

It is important to stress that information costs could be borne to a great extent by schools and families in addition to government. The cost of information development could be borne by schools and might not be new or larger for private schools than at present unless the information were to be disseminated across a larger audience. However, such costs would be extended to a larger number of schools, because under a voucher plan, all schools would be private, or existing public schools would also need to provide information to be competitive. On the other hand, the lion's share of the costs of obtaining information could be borne by parents as they inquire about schools through both formal and informal means. In the Milwaukee voucher program, for example, parents frequently learned about the program through informal communication, a reasonable approach when a maximum of only 12 schools were involved (Witte et al. 1993).

Government might bear a large share of information costs where equal access is an important consideration. Government would need to play a large role in helping parents with meager resources to obtain and evaluate information. It should be noted that such systems of choice have been characterized by much lower levels of familiarity with, and poorer use of, information by nonwhite and low-income parents than by white and middle-income parents (Bridge 1978; Archbald 1988).

Massachusetts provides an example of how information can be conveyed to families who have increased school choice (Glenn, McLaughlin, and Salganik 1993). Sixteen cities in Massachusetts recently began to allow parents to choose the public school their child attends. Parents obtain information about schools through a variety of means, including school visits, conversations with friends and neighbors, and brochures distributed by schools. Thus, both families and schools contribute to the costs of sharing information. We have not seen data on the extent to which these costs have resulted from the school choice policies of these districts, but one new way of sharing information has emerged—Parent Information Centers (PICs)—funded with state desegregation monies. PICs have served to supplement information from other sources and have been particularly helpful to families with limited English-language skills. At these centers, parents can get written information and learn from trained counselors. Such centers might well be needed in a voucher plan situation in which parents would be faced with a myriad of options and would require unbiased, well-informed assistance in selecting a school.

Government might bear a large share of information costs where equal access is an important consideration.

What are the costs of these PICs? The 16 Massachusetts cities have a combined enrollment of about 200,000 students, and the PICs serve the families of about one-third of these students each year (65,000) as they choose a school or move from one school level to another. The total annual costs of the PICs are about $2.5 million, so the per-pupil cost is about $38 per year for this fairly modest information dissemination approach.[7] A more extensive approach, which would ensure substantial services in terms of extensive data and counselors to interpret that data, would be more costly. Further, the Massachusetts data do not include costs to parents or schools, only to government.

Costs of Adjudication

If there is no flexibility in a voucher plan—that is, if all families were to receive a voucher of a uniform size for each of their school-age children—then the only cause for legal dispute might be a child's real age. In such cases, there would be few disputes, and we believe costs to resolve them would be minimal. As we have noted, though, several factors might complicate a voucher plan; these include the eligibility of certain classes of students and schools and the variability in voucher size. We suggest that as a voucher system becomes increasingly complex and requires multiple judgments regarding eligibility for a given voucher amount, disputes surrounding these judgments will increase, and the cost of resolving them will rise. A potential for dispute can be seen when parents wish to move their child from one school to another because of a residential move, a job change, or the child is not doing well, and the parent believes that the school misrepresented its ability to meet his or her child's needs. In the latter case, a school that has included the child's voucher in its budget for the year would likely be reluctant to share

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[7] Charles Glenn; personal communication with H. Levin, December 1994.

A system that provides voucher amounts according to family income would risk disputes about relative voucher amounts, whereas a system that provides a set amount would not.

that voucher amount with a new school. A system that provides voucher amounts according to family income would risk disputes about relative voucher amounts, whereas a system that provides a set amount would not.

A recent California proposition (Proposition 174) provided for a uniform voucher amount for all students (State of California 1993). In November 1993, this proposition was voted down and an initiative that would provide larger voucher amounts for children from low-income families and children entitled to special education services recently has been circulated. This example shows how adding the single complicating factor of variability might give rise to disputes, and it is hard to imagine that some families of marginally low income, but not so-deemed by law, would not dispute their status under a voucher plan. However, even with uniform vouchers, a change of schools during the school year would require either a prorated refund (to allow the child to register at a different school) or a system for adjudicating the conditions under which the student could change schools.

Adjudication costs would be a function of the number of cases in which the need for adjudication arises and the cost of creating and maintaining the adjudication system. The former would be determined by the complexity of the voucher system (partially by the frequency of school changes), and the latter would depend on the choice of dispute resolution systems. For example, a system that limits resolution to the decision of one arbiter would be less costly than one in which a panel of arbiters offers decisions that could be appealed.

What might these costs look like? To provide some indication, we turned to Salzer's study detailing the costs of special education mediation conferences and state due process hearings in California (Salzer 1987). Public Law (P.L.) 94-142 provides for due process hearings for parents of special education children who disagree with school district actions that affect their children. Although P.L. 94-142 and many state companion laws are highly complicated and require many contestable actions, Salzer's study of mediation conferences and state due process hearings begins to provide a range of dispute resolution costs that could apply under a voucher system.

Salzer describes three alternative routes for dispute resolution in California. The first route—mediation conferences—involves parents and school district representatives in a one-day session with a mediator. If this fails, one or both parties can request a state due process hearing (the second route), which must be held within 45 days after the mediation conference. The third route is direct recourse to a state due process hearing, eliminating the intermediate mediation step. Salzer focused on both parent and school district costs with regard to the three routes. Table 7 shows the costs that Salzer found in 1981 (in 1990 dollars).

A third set of costs, which Salzer discusses briefly, are the salaries of mediators and due-process hearing officers. These costs, although not insignificant, are quite small compared with the costs shown in Table 7. For example, the cost of a mediator for a one-day hearing (the first route) was $190 (in 1990 dollars).

Salzer notes several reasons why district costs were so much higher than parent costs. The most important reason was the cost of legal representation: districts tend to hire more expensive attorneys than do parents. In addition, Salzer notes what she calls "indirect costs," which were the costs of either parent or district staff time. Her valuation of the cost of district staff time was considerably greater than that of parent time.

How relevant is this analogy for disputes that might result from decisions surrounding

Table 7.— Average costs of special education dispute resolution in California by dispute resolution method: 1981 (in 1990 dollars)

Method	Cost to parent	Cost to school district	Combined cost
Mediation (route 1)	$496	$1,965	$2,461
Mediation and due process (route 2)	2,277	4,642	6,919
Due process (route 3)	3,282	6,089	9,371

SOURCE: *Evaluation and Cost Estimation of Special Education Mediation Conferences in California*—dissertation submitted to Stanford University's School of Education and the Committee on Graduate Studies by K.W. Salzer, 1987.

> ...a potential and important source of disputes would involve the mobility of families during the school year.

vouchers? As noted above, the increasing complexity of a voucher system would probably increase the likelihood of disputes, and probably their cost, because parents and/or administrative staff would need more time to assure that they were preparing a case that covered all the bases. In addition, a potential and important source of disputes would involve the mobility of families during the school year. Vouchers could be prorated so that when families move, they receive a voucher that covers school costs for the balance of the year. But this will not solve a problem that schools could face: consider that at the start of a school year, schools invest in resources—not only supplies, but staff and facilities—for that year. Much of this investment will represent fixed costs that will be lost if some students leave the school. Therefore, schools would not want to return partial or prorated vouchers. One method of resolving this problem is to allow schools to charge higher prices at the outset to cover any losses they may incur if families move. The other method is to resolve disputes through a process, perhaps greatly increasing the number of disputes that may occur.

In any case, there will be a minimum cost associated with each dispute resolution, no matter what method is used to resolve the dispute. Even excluding attorney costs, there will be both parent and administrative time, as well as the cost of a mediator or other officer to aid or decree the resolution. To determine a minimum cost, let us assume that parent, administration, and mediator costs are only half of Salzer's first dispute resolution route cost, and further assume that both parties represent themselves. To determine a high cost figure, let us use half of her third resolution route figures, including the cost of legal representation. Table 8 shows these low and high cost estimates for dispute resolution.

Table 8.— Projected low and high cost estimates per case for voucher-related dispute resolution under a voucher plan (in 1990 dollars)

Low cost	High cost
$1,632	$5,854

SOURCE: *Evaluation and Cost Estimation of Special Education Mediation Conferences in California*—dissertation submitted to Stanford University's School of Education and the Committee on Graduate Studies by K.W. Salzer, 1987.

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The purpose of this study was to explore the costs that might be associated with the construction of a publicly-funded voucher approach to education.

Finally, it is important to mention Salzer's finding that fewer than 1 percent of all special education cases entered mediation or due process (p. 38). Therefore, even though our cost of resolution appears quite high, the number of cases requiring this type of resolution probably would be very small.

Summary

The purpose of this study was to explore the costs that might be associated with the construction of a publicly-funded voucher approach to education. Our analysis shows there probably will be additional costs in several important categories over and above those arising in the current provision of education. For a variety of reasons, the costs presented should be considered provocative rather than definitive. To provide more precise figures, it would be necessary to know the specifics of the voucher plan, features of the setting in which it would be applied, the behavioral responses of families and schools to the new framework, and the method of determining costs and their distribution among families, schools, and government. In addition, we would need to know what, if any, cost savings would result from replacing the existing public school system. In the absence of these data, it is impossible to provide a reasonably precise picture of the net costs associated with a voucher plan. However, we have identified probable costs and used existing programs that are somewhat analogous to an educational voucher system to illustrate the potential magnitude of the costs, hoping to launch the policy discussions necessary for informed public education decisions.

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Intrastate Cost Adjustments

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Selected
Papers in
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Finance

Intrastate Cost Adjustments

Intrastate Cost Adjustments

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Overview

Within states, geographic differences in the cost of education (COE), the cost of living (COL), and the unit costs of government services (COGs) are known to be considerable. Recipients of public services, including school children and welfare recipients in what often are high-price inner-city areas, receive proportionally less aid than do those with equal need in low-price areas.

Recipients of public services...in what often are high-price-inner-city areas, receive proportionally less aid than do those with equal need in low-price areas.

The rationale for trying to convert nominal values to real terms by removing the effect of price differences is clear. On efficiency grounds, comparison in real terms is more meaningful and permits the removal of disguised subsidies. On horizontal equity grounds, equal needs warrant responses with equal resources. Yet, there are formidable conceptual and empirical problems. A conceptually clean identification and measurement of regional cost differences is needed. Different issues are raised when deciding how these measures are to be used in making regional cost adjustments.

With respect to empirical measures, several studies have produced *interstate* indices of COL (McMahon 1991; Nelson 1991), COE (Barro 1994), COGs, and prevailing wages (Barro 1994; Halstead 1992). The COGs are determined primarily by prevailing wages, so the latter two are essentially the same thing. Within states, indices have been produced, for each of the above, but these tend to be limited to a few specific localities in each state, as in work by the American Chamber of Commerce Research Association (ACCRA) (1994), Halstead (1992, pp. 140-179), and McMahon and Chang (1991, pp. 16-23). Intrastate COL, prevailing wage, or COE indices covering all localities within a state are available only for a few states, mostly those states where a large investment has been made, and include indices formulated by Simmons et al. (1973) for Florida; Chambers, Odden, and Vincent (1976) for Missouri; Chambers (1980a) for California; Augenblick and Adams (1979) for Texas; Wendling (1979) for New York; Rosenthal, Moskowitz, and Barro (1981) for Maryland; and Nelson (1994) for Michigan. Chambers and Fowler (1995) have recently produced a teachers' cost index (TCI) at state-wide and district levels. Texas has attempted to provide a COE adjustment. Only a few other states, including Florida, Alaska, and Ohio, have introduced regional cost adjustment factors into their school aid formulas, usually by adjusting for differences in consumer prices or the COL.

It is important to begin this discussion by distinguishing between a COE index and a COL index.

Measures of unit-cost differences covering all small local areas within states do not exist because of the enormous cost associated with collecting price data in each locality and repeating the correlation process periodically to keep this data updated. Also, budget studies must be made periodically of the school district or household expenditures to which the index is to apply to determine appropriate weights.

The first section of this paper considers the conceptual issues that affect both a COL index and a COE index (or cost-of-direct-services index), including consideration of what each index covers. This section offers new insights that relate to endogenous prices and costs, the treatment of nonmonetary amenities, and a conceptually clean measure of unit costs. This section also considers the potential use of these indices to study equity, as well as the kinds of adjustments that need to be made when considering their potential use for making regional cost adjustments in financial transfer mechanisms.

The second section of this paper presents the theoretical model and methods of measuring cost differences among school districts. The third section presents the empirical results, reporting cost differences among school districts, counties, and states. New information in this section includes the use of local data at the school-district level, nationwide, that are available for the first time. The National Center for Education Statistics (NCES) has mapped the decennial census data to school districts in a way that has made this study possible (U.S. Department of Education 1994). School-district-level COL indices are missing for a small number of districts in New York, New Jersey, and California, but cost indices are computed for all other school districts in the United states. They also are reported after normalization within each state, with the statewide index at 100 in order to isolate intrastate differences. Indices more relevant to the cost of education are computed for all counties within each state, and then for statewide cost indices for each state, based on these school district-level data. The fourth section of this paper summarizes the conclusions and considers major implications.

Conceptual Framework: Alternative Approaches And Issues

Alternative Approaches

It is important to begin this discussion by distinguishing between a COE index and a COL index. A COE index is normally based directly on the prices paid by local schools for teachers' and administrators' salaries and for other items, such as heating or books; these prices are weighted by the relative importance of each item in school district budgets. It generically is a COGs index, although the latter is known to change very closely with locally prevailing wages ($R^2 = 0.98$, as computed by Halstead 1992, pp. 125-79). Details of construction of these indices were developed by Barro (1994) and Halstead (1992, pp. 125-79), respectively.

There are several variants of COE indices. One is to augment the COGs-type index with costs unique to the education process itself (as distinguished from area-wide production costs facing all kinds of producers), such as the high cost of educating large numbers of low-achieving children. A second variant is to estimate structural demand and supply using equations specific to education in each locality (McMahon 1970; Brazer and Anderson 1983) in order to obtain structural estimates of the cost functions of school districts.

A COL, on the other hand, seeks to measure the cost of living faced by teachers, administrators, and other local employees. If teachers' job markets work, teachers will move at the margin, and school district budgets will reflect these local costs. In any event, these are the costs, or potential costs, faced by school districts, since about 80 percent of the operating costs of school districts are salaries for teachers, administrators, and maintenance personnel. Their cost of living entails weights that reflect the climate (for example, heating costs); these also affect school district costs. This second approach does not use local teachers' salaries or other endogenous costs that are subject to manipulation by local school districts. All of the states that have made or recommended the use of regional cost adjustments have used a modified COL index, except for Ohio's use of prevailing wages (which essentially is a COGs index) and Texas, which uses a COE adjustment.

Each basic approach and each variant has both strengths and weaknesses, thus, it is not a matter of a search for the perfect index. Instead, the purpose for which the index is to be used must be considered. Also, the net gain in accuracy to be achieved is an important consideration if the choice is to collect the local price data and determine the appropriate weights in relation to the costs of this type of data collection.

Conceptual Issues Involving Regional Differences in Unit Costs

Conceptually, what is needed for determining regional cost differences, either within states or among states, is a measure of price differences that determine the unit costs of purchasing a standardized market basket of inputs of fixed quality. The inputs purchased are specific to those needed to produce education by the district (the COE indices) or those needed to produce a given living standard for its teachers, administrators, and other school personnel (a COL index). These prices *should not be subject to the control of the school district or the state*, if the index is to be used not just for studying efficiency and equity but also potentially for purposes of reimbursing districts for differences in costs. Instead, the prices should be determined by the local markets in which schools and others purchase inputs. This is the first major conceptual issue to be discussed.

Issue 1: Avoiding Cost-Based Reimbursement and Cost Endogeneity

In economic theory, each school district (or local governmental unit) has an average cost curve showing the unit cost at each level of output of a given quality. This cost curve shifts vertically with any increase in salary rates or the price of other inputs.

Cost-Based Reimbursements

To reimburse in full for cost differences when those costs are under the control of the local unit, as are teacher and administrator salaries, encourages inefficiency and invites disaster. This practice is known to provide incentives to pad costs, including not only higher prices but also overutilization. Examples abound from studies of reimbursement of local health care providers by health insurance and other third-party payers. Both prices and utilization therefore must be regulated. Cost-based reimbursement is also common in the setting of public utility electricity rates. In these areas, the lack of true price competition leads to an escalation of unit costs and to considerable internal inefficiency. It also leads to the need for price or rate regulation, as in the case of the state judicial proceedings that set utility rates. These proceedings are characterized by state-level bureaucratic regulatory bodies that frequently are captured by the producers whose prices are being regulated.

In the case of school districts, cost-based reimbursement by states frequently is practiced for transportation, some special education programs, and other categorical programs. There needs to be a degree of regulation of prices, limits on eligibility and the services to be financed, and budget caps. It

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is obvious that expanding this practice any further is quite undesirable, even though it may be attractive to the providers, for the sake of preserving decentralized decision-making and internal cost efficiency.

The negative effects of endogenous prices and costs can be avoided if the prices on which the cost adjustments are based are kept outside the control of the school district and the state Government. This is true for prevailing wages throughout the community or for geographic differences in the COL. A COE index specific to the school district based on local teachers' and administrators' wages does not meet this test, although it is sometimes stressed that the portion of the budgets beyond school district control needs to be isolated for use in the COE (Chambers 1981, p. 61). Nor does a regional cost adjustment index based directly on teachers' wages meet the test. However, a COL index for the entire community or a COGs index based on prevailing wages would reflect conditions that are outside the school district's control. Where a county-wide price index is used, as is suggested later, the school district's maximum impact on county-wide prices for any or all items in the index can reasonably be assumed to be negligible because it is such a small part of the county-wide economy.

A similar cost-endogeneity problem arises when reimbursement is based on costs related to scale. Studies of school district costs frequently confirm the earlier finding by John Riew (1966) that the long-run average cost (LRAC) curve slopes downward to the point where the district reaches optimum scale, usually where it is large enough to have a high school with 800 to 1,000 pupils. This is followed by a long, flat section ("L-shaped" LRAC), then a rise showing unit costs in the gigantic megalopolis districts, such as Los Angeles, Detroit, and Chicago. Exceptions to this, of course (including some in studies without appropriate controls), are documented in the literature. This characterization is useful for making the basic point clear, that is, should the district be reimbursed for any possible differences in unit costs associated with scale?

The answer, based on the economic principles involved and not on the political clout of large and rural districts, is no. Major steps have been taken in most states to consolidate small rural districts to achieve lower unit costs and the economies of scale that accompany movement down the steep portion of the LRAC curve. At given levels of educational effectiveness, reimbursing districts for their higher costs due to inefficient scales or other inefficiencies would provide a short-run improvement for the children involved. In the long run, however, this would provide a clear disincentive to achieving greater efficiency.

The point is, regardless of economies of scale, inefficiencies (high unit cost at given levels of effectiveness, or learning per pupil), are included in school district cost functions. When these cost functions are estimated econometrically, using district enrollment as in the Chambers-Fowler teachers' cost index (TCI, 1995, p. 97), or when cost data are collected in other ways directly from school districts, such inefficiencies are included in the costs. If these costs or salaries are reimbursed, local school districts have no incentive to merge to reduce the cost involved and hence can manipulate the policy to avoid achieving greater efficiencies.

At the other end of the LRAC curve, if it does eventually reveal rising unit costs (at given educational effectiveness levels), this would help to explain why some large districts, such as Chicago, are experimenting with breaking up their large size in an effort to achieve greater efficiency by reducing the diseconomies of scale, as well as to secure greater parental involvement. Cost-based reimbursement for the diseconomies of large scale again endogenizes these costs in the long run and provides a disincentive to efforts to achieve greater cost effectiveness in these larger districts. (e.g., see Chambers and Fowler, 1995, p. 97, coefficient for DIST. ENROLLMENT > 100,000).

Avoiding Cost Endogeneity

As suggested above, cost endogeneity is one of the problems inherent in the approach that seeks to use either structural or reduced form (e.g., a TCI) estimates of school district demand and cost functions for making cost adjustments in funding formulas. This procedure may be justified, however, for analyses of cost differences, efficiency, and equity. It is quite consistent with the theory and is useful for empirical analysis of the behavior of school districts and what determines funding levels (Chambers 1980, p. 48; McMahon 1970), and subsequent articles that sought to estimate the cost and demand functions by simultaneous equation methods). It is the use of these econometric structural equation estimates of what are really the LRAC curves of the school district (Brazer and Anderson 1983) or of COE or TCI for making regional cost adjustments by states that entails the risk of endogenizing cost inefficiencies. Even though these econometric parameter estimates constitute statewide averages, they reflect teacher salaries and diseconomies of small scale that may imbed cost inefficiencies or be manipulated by state-level interest groups.

There is the possibility of using a broader COGs index largely based on prevailing wages, which now is being done in Ohio. In government, however, prevailing wages are of necessity, primarily wages that must be paid to maintenance personnel, since universal occupations such as retail trade and service positions must be used to maintain comparability across localities. One cannot include the salaries of microchip specialists or Wall Street brokers in the index. Since education is more human-capital intensive than most trade and service occupations, a COL index is more likely to approximate the true cost of living faced by teachers and administrators with comparable skills in different localities, and hence school district costs, than a COGs index.

We opt, therefore, for an index based on county-wide prices, even though a COE index has the distinct advantage of being specific to school purchases. Although this is the COE index's greatest strength, it is also its greatest weakness for purposes of making cost adjustments in school aid formulas. School district expenditures and state policies for reimbursing schools would not affect a geographic COL index or a cost-of-government-services index based on area-wide prevailing wages, since school district expenditures constitute less than 5 percent of local expenditures. It is these area-wide price factors that determine local input prices that in turn shift the long-run (and short-run) average cost curves of school districts vertically, consistent with the logic of unit costs in economic theory.

In particular, salaries, wages, and benefits, as indicated above, constitute about 80 percent of the total operating costs of schools, with salaries at about 64 percent and employee benefits comprising another 16 percent. They largely are determined by, and rise and fall with, the local prices of housing, heating, food, and health care. This occurs because school district personnel being hired for the first time or who are otherwise at the margin will move to districts offering more in real terms for comparable skills. The other 20 percent of school inputs are largely purchased locally at prices comparable to the purchases of teachers, administrators, and other school personnel. The same is true for the cost of competitive health care or other public services, which also tend to be service intensive. The purchasing power of payments under non-education-related entitlements, such as welfare or social security, would depend, in principle, even more heavily on the local cost of living.

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> The objective of COL indices is to determine the price or cost of the same real living standard at different locations.

The use of prices times quantities differentiates a geographic COL index from a geographic price index. Both indices give greater weight to those prices of items that appear large in the household budget (for example, annual housing costs) and less weight to the price differences for items that are a small part of household budgets (for example, salt). This gives greater weight to the costs of living (or producing) in the locality, such as the higher costs of heating or cooling, which also applies to the higher costs of heating or cooling school buildings. The objective of COL indices is to determine the price or cost of the same real living standard at different locations. If net savings are approximately zero, as they are over a typical life cycle, it is these *living costs* that will determine teacher salaries and benefits.

Issue 2: The Treatment of Nonmonetary Amenities

When using a geographic COL index, prevailing wages, or an education cost index to make regional cost adjustments, an important point to remember is that these indices do not remove the value of the differences in local amenities that are both relevant to the quality of life and production costs. Amenities include: access to forests, lakes, ocean beaches, and sunny climate; proximity to major cities and access to job opportunities; access to good schools and colleges; access to cultural opportunities; pleasant neighborhoods; and a lower local crime rate. The cost of living in a particular neighborhood may be higher, but the amenities may also be higher, thereby justifying the higher living costs. If local price levels are higher because of these nonmarket amenities, this will affect the cost of living and the prices of goods and services for school districts.

The need to consider adjustments for amenities is not unique to a COL index but is common to all market-based regional cost adjustments. A correction for some negative amenities is already included in both a COL index and a COE index for high heating, air conditioning, and transportation costs. On the other side of the coin, a further correction for positive amenities is included when using a COL index by choosing to use the county-wide rather than the local school district cost of living, since teachers are likely to choose to live outside of the highest-cost, highest-amenity districts, but nevertheless nearby. The TCI index based primarily on teachers' salaries at the school district level also makes this additional correction for amenities in that teachers and other employees are likely to be willing to accept somewhat lower salaries (that is, not pass on the higher living costs entirely to their employers) and to live nearby or absorb some of the monetary costs themselves, since they are receiving the nonmonetary benefits of the better environment.

Before using a COL index, even where it is county-wide, or a COE index to deflate living costs or school district costs, a qualitative judgment needs to be made about the presence or absence of extraordinary community-wide or on-the-job amenities for the locality in question. If these amenities are substantial, an additional adjustment based on this judgment needs to be made. The Illinois Task Force on School Finance (1993) recommended downward adjustment of geographic differences in the cost of living by about 30 percent to reduce any monetary distortions attributable primarily to extraordinary nonmonetary amenities. This may be too high when done across the board in this fashion, but there is no doubt that, in specific locations, nonmonetary amenity benefits exist that partially justify somewhat higher living costs.

Widely accepted, precise valuation of amenities for all areas is likely never to be practical.[1] It is dependent to some extent on advances in the broader research in economics or nonmarket economics and shadow pricing (Bloomquist, Berger, and Hoehn 1988). In the last analysis, the amount of the higher living costs in those specific areas where significant amenities exist that are absorbed by the employees versus the employers will depend on the elasticity of demand for school district employees in those locations (Nelson 1993). If there are a large number of substitute employees available at a salary that covers the differential cost of living, then demand is elastic, and employees may have to absorb some of these higher costs and accept some of their total compensation in the form of nonmonetary amenities.

Issue 3: A Theoretically Clean Concept of Cost

Cost indices do not reflect pure differences in cost if they contain elements that really measure higher quality or that measure other partly demand-related factors.

Quality or Effectiveness

For example, training adjustments, which reimburse districts that hire teachers with more or better training, may be justified on the grounds of providing incentives to districts to improve the education of their teachers. But as pointed out by Chambers (1981a p. 42), these are not true unit-cost-based COE indices. Such incentive payments also do not encounter the prior objection of encouraging increases in the price without also requiring improvements in the quality of these inputs.

Equity

Beyond this, COE and TCI indices have sought to include reimbursement for higher costs where there are larger numbers of less able or disadvantaged pupils in the pupil mix. Although the objectives for doing this may be worthy, and although some compensation for these local conditions does need to be provided, such reimbursement can be and usually is provided through the provision of statewide foundation levels, special pupil weightings, or separate categorical programs for poor, disabled, or other special-needs students. This paper takes the position that including these elements in a cost index obscures the meaning of a pure cost adjustment. "Costs" normally refers exclusively to the supply side, whereas the equation used to predict TCI is a reduced form that includes demand factors. The rationale for responding to special local educational needs comes from the demand side, that is, the statewide demand for public goods, including merit goods. The latter, seeking to equalize outcomes among pupils, is philosophically a Rawlsian positivist or humanitarian level of vertical equity that reflects public demand (Rawls 1977).

The Politics and Equity of Regional Cost Adjustments

Since prices and unit costs tend to be highest in high-income areas, both among states and within states (except for some higher-cost urban ghettoes), the net effect of any regional cost adjustment of federal or state grants will tend to redistribute state aid toward the higher-income suburban districts. Poverty and a higher incidence of need often will be found together, especially in the lower-income and rural areas. Therefore, legislators from the highest-income districts, with some exceptions, will tend to favor

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[1] The value of amenities is not just an imputation based on the site value of lots (Halstead 1992, p. 200). Site values can be driven up by businesses bidding for particular locations, presumably lowering amenities. Site values can also be higher due to higher land fertility, tax advantages, reductions in interest rates, availability of retirement facilities, and other factors not related to the nonmonetary amenities enjoyed by school district employees.

regional cost adjustments, and those from low-income and rural districts will tend to oppose such adjustments.

Some ways to compensate for the inequities that accompany sudden introduction of regional cost adjustments are needed. These are discussed in the conclusions section later.

> Differences in community-wide demands for all goods and services are determined...by business demands for personnel and real estate, personal demands for products that depend on per capita personal income, and local tastes.

Measurement of Cost Differences Within States

To measure intrastate cost-of-living differences, one first must find the intrastate COL determinants for which data exist in the 1990 U.S. census and then obtain school district data on related differences in the costs of producing education or other public services. The following focuses on COL differences, since, as indicated above, if the results are ever to be used for regional cost adjustments, COL differences do not entail the problem of endogenizing costs.

The Theory of Determinants of Cost Differences

This theory focuses on the structural demand, supply, and price of goods and services purchased by teachers and other public employees, which in turn largely determine the nominal salaries of those individuals with given skill levels, hence cost of education and other public services. The input prices shift the average and marginal cost curve for the production of public goods, and hence the market supply curves, vertically.

Differences in community-wide demands for all goods and services are determined largely by business demands for personnel and real estate, personal demands for products that depend on per capita personal income, and local tastes. Business demands and personal income reflect the production advantages or disadvantages in the locality, much as prevailing wages do. But personal income also reflects human capital and income from the financial assets of the wage and salary earners.

As demand rises, the prices of transportable goods such as clothing rise, but supplies then respond. Geographic differences in these prices do not remain large, although some do persist, reflecting local monopoly and different retailer costs. But supplies of other items, such as housing and land, and hence, housing costs are not perfectly elastic, and their prices rise.

The structural demand function in equation (1) below expresses the quantity of goods and services demanded in any particular locality (q) as a negative function of price, p ($a_1 < 0$), a positive function of per capita income, Y ($a_2 > 0$), and a positive function of population change, $\text{Đ}P$, reflecting tastes for the locality ($a_3 > 0$):

$$(1)\quad q = a_1 p + a_2 Y + a_3 \text{Đ}P + \mu_1.$$

The supply price is a positive function of quantity, q ($a_4 > 0$), an ambiguous function of population growth and/or density ($a_5 >$ or < 0), and a positive function of housing costs, H ($a_6 > 0$), or other costs that are price inelastic.

$$(2)\quad p = a_4 q + a_5 \text{Đ}P + a_6 H + \mu_2.$$

When these demand and supply equations are solved simultaneously, eliminating q, and then multiplied through by the appropriate quantity weight, $\overline{q}$, representing the standardized market basket of goods and services designed to maintain the same level of well-being in each area, the result is a reduced-form equation for the cost of living:

$$(3)\quad \text{COL} = p\overline{q} = \text{ß}_1 H + \text{ß}_2 Y + \text{ß}_3 \text{Đ}P + \mu_3.$$

In equation (3), housing costs (H) and income (Y) logically can be expected to have a positive effect, and population change ($\text{Đ}P$)

and density have net effects that are indeterminate, since both operate in two directions (McMahon 1991, pp. 403-413; Nelson 1991, pp. 103-104).

Estimation of the Model

It is not practical to estimate the underlying structural demand and supply equations by simultaneous equation methods, because many goods and services are included in each budget, and there are no separate measures for *p* and *q*. There are also many localities involved for which detailed price data are needed.

It is possible, however, to aggregate across commodities and to estimate using the reduced-form equation. The U.S. Bureau of Labor Statistics (BLS) took the lead in collecting price data and developing budget studies to determine weights for regional COLs based on these budget studies. Although this was discontinued in 1981 (U.S. Bureau of Labor Statistics 1982), it still provides a benchmark for a cross-check on work herein, which is based on more recent ACCRA data.

The concept behind the model is one of living costs of a middle-income family of four, which is probably reasonably typical of teachers' or school administrators' salaries. The BLS concept also includes larger weights for heating costs in the North, for example, or air conditioning costs in the South, not unlike heating and cooling costs or other supply-side costs faced by school districts, as mentioned above.

The model given by equation (3) first was estimated using the BLS data from 1981, the last year in which such data were collected, with the results as shown in equation (4) (Table 1). The results were as expected. The equation was tested over several years, with the conclusion that there was no evidence of significant change in the structure over time. The addition of climate, population levels, and other variables were tried separately but did not improve upon the explanation (McMahon 1991, pp. 434-38).

The equation was tested over several years, with the conclusion that there was no evidence of significant change in the structure over time.

F. Howard Nelson estimated this model for states using 1988 ACCRA data for 178 localities (Nelson 1991), providing independent verification of the earlier results. However, Nelson's estimate also established significant differences among regions similar to those found earlier by McMahon and Melton (1978) using seemingly unrelated regression methods. New home value (*NV*), when added by Nelson, either is not significant or, in the West only, appears to be highly colinear with *H* (the median home value) and to cause its *t*-value to become highly insignificant. Population density, *D*, is not significant except in the East, where again it appears to be colinear with *H*, lowering the *t*-statistic for *H* (Nelson 1991, p. 106).

Therefore, equation (4) was re-estimated and is shown as equation (5) in Table 1, using the 1990 ACCRA data and values of *H*, *Y*, and *DP* specific to each school district. There are no data on square miles and on population density by school district, so this equation cannot be used for a district-level index. The effect of this variable in Nelson's (1991) study appeared to be highly colinear with *H*, disturbing the result, so density was not included.

Tests were performed for heteroscedasticity, with all the Chi-squares indicating that the hypothesis that there is significant heteroscedasticity cannot be rejected. A correction for heteroscedasticity was made, with the results as shown in both equations (5) and (6) in Table 1. The dependent-variable heteroscedasticity method was used, estimating alpha by regressing the dependent variable times *b* times alpha

Equation (6) was recalculated, dropping Y, with the result that the predictions were unaffected, as is suggested by its very small standardized regression coefficient (beta)...

Table 1.— Determinants of Geographic Cost Differences

$$\begin{array}{lclllllll}
(4)\ \text{COL 1981} & = & 0.182\,H & + & 0.002\,Y & - & 0.56\,\text{Đ}P & + & 67.6 \qquad R^2 = 0.552 \\
 & & (2.61) & & (1.63) & & (-2.22) & & \\
(5)\ \text{COL} & = & 0.217\,H & + & 0.025\,Y & - & 0.0037\,\text{Đ}P & + & 85.83 \qquad R^2 = 0.532 \quad \alpha = 0.0658 \\
 & & (13.58) & & (0.25) & & (-0.006) & & \qquad\qquad n = 293 \quad t = 24.10 \\
(6)\ \text{COL} & = & 0.182\,H & + & 0.015\,Y & + & 0.078\,\text{Đ}P & + & 89.14 \\
 & & (11.43) & & (0.16) & & (1.28) & & \\
 & & -\,1.59\,NC & - & 3.91\,S & + & 4.77\,NE & & \qquad\qquad R^2 = 0.591 \quad \alpha = 0.0611 \\
 & & (-1.34) & & (-3.46) & & (3.29) & & \qquad\qquad n = 293 \quad t = 24.12
\end{array}$$

Partial correlation coefficients for equation (6):
0.56 (*H*); 0.01 (*Y*); 0.08 (*ĐP*); -0.08 (*NC*); -0.20 (*S*); 0.19 (*NE*); 0.95 (Constant)

Standardized coefficients (betas):
0.64 (*H*); 0.006 (*Y*); 0.06 (*ĐP*); 0.08 (*NC*); 0.18 (*S*); 0.15 (*NE*); 0 (Constant)

Definitions

COL 1981 = the cost of living as measured by the Bureau of Labor Statistics (1982) for 1981, the last year in which it was computed by the Bureau.

COL = Cost of living in 1990, as measured using ACCRA (1993) data.
H = is the value of housing (the median value of an existing house).
Y = is the per capita personal income, in thousands of dollars.
ĐP = is the percent change in population for the preceding decade divided by 2 (or for 5 years, in the case of equation [4]).

NC, *S*, and *NE* = regional dummy variables, where 1 = North Central, 1 = South, and 1 = Northeast, respectively. 1 = West is omitted to allow for a numeraire.

against the squared deviation. For equation (6), $\alpha = 0.0611$ and its SE = 0.0025.[2]

With this much-larger ACCRA sample and recent data specific to school districts, the results in equations (4) and (5) are similar. The coefficient for *H* is about the same, as is the R^2. The effect of income is slightly larger and less significant, but its effect is picked up by the median value of housing (value of a standardized house is not available by district) and in equation (6) by the Northeast dummy variable, so its true significance to geographic price differences should not be underestimated. The effects of change in population are smaller for 1990 than they were for 1981 following the large oil price shock, which resulted in a northern states recession and movement toward the oil-producing states. This suggests a modest structural change, but not one that is totally unexpected.

The coefficients of *Y* do not always reach the 0.05 level since its effect is picked up by H. Equation (6) was recalculated, dropping *Y*, with the result that the predictions were unaffected, as is suggested by its very small standardized regression coefficient (beta) in the bottom line of Table 1. Specifically, the regression on the ACCRA sample was recalculated, all the predicted COLs were recomputed, and the result was compared with both the prediction using *Y* and with ACCRA's direct measure of the cost of living. In more than 90 percent of the cases, the net difference to the prediction was less than three one-hundredths (0.03) of one percentage point, with and without *Y* in the regression. In all other cases, the difference was extremely small (less than 0.15 of one percentage point), except for Charleston, SC, and Greenville, SC. In these cases, the prediction with Y for Charleston was about 0.4 of a percentage point better than with the ACCRA actual measure and 0.5 of a percentage point worse for Greenville.[3] Estimates of the partial correlation and standardized regression (beta) coefficients shown in Table 1 indicate that Y is contributing almost nothing (less than 1 percent) to the total explanation. Its multicolinearity with H raises its standard error but does not bias the coefficient. For equation (6) without Y, NE and NC become a proxy for Y and take on slightly larger coefficients (4.79 and -1.48). The other coefficients are essentially unaffected ($H = 0.183$ and $\Delta P = 0.080$). Y is retained in equation (6) to gain the advantage of comparability with other results, equations (4) and (5) and earlier studies, since it is a logical part of the explanation and does not affect the outcome.

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[2] This is the method used in Shazam, a computer program for econometric analyses that includes the possibility for making corrections for heteroscedasticity.

In further analysis of the regional dummy variables, since Nelson (1991) and McMahon and Melton (1978) found these regional differences to be significant earlier, this regression was then recalculated separately for each of the four regions by seemingly unrelated regression methods (not shown). The coefficients in the separate regional equations and the t-statistics are remarkably similar to those in equation (6). In fact, they are nearly identical, so equation (6) is chosen, with the regional dummy variables acting like shift factors. It has been corrected for heteroscedasticity, as mentioned above.

The 293 school districts in the ACCRA sample were then separated into 31 primary metropolitan statistical areas (PMSAs), 176 metropolitan statistical areas (MSAs), and 184 nonmetropolitan areas, and separate regressions were run for each group. However, this led to an inferior result, presumably because there is more homogeneity and less variation left to explain within each category.

The result shown in equation (6) is still the preferred result. It is used for prediction of the regional cost of living among all of the more than 14,000 school districts in the United States for which ACCRA cost-of-living data do not exist. Where the direct ACCRA measures do exist, they were used for these 293 localities. Equation (6) has the highest R^2 (0.591, which is good for cross-sectional data) and the best t-statistics (except for Y).

It is the introduction of the regional dummy variables that causes the population change variable to become positive and more significant, as can be seen by comparing equations (5) and (6). Presumably, the movement out of the more heavily populated Northeast and North Central areas to the lower-cost South and higher-cost West areas allows the effect of population increases to be revealed in a more consistent fashion. The t-statistic for ΔP still is below the 0.05 level. But the coefficient for ΔP does reach the 90 percent confidence level (that is, the 0.10 level) and therefore contributes to the predictive accuracy of the result with a high degree of probability.

Presumably, the movement out of the more heavily populated Northeast and North Central areas to the lower-cost South and higher-cost West areas allows the effect of population increases to be revealed in a more consistent fashion.

Figure 1 compares the actual ACCRA COL values with the model-predicted cost of living values for the 293 sample districts. This is for the purpose of testing the predictive accuracy of the equation that will be used to predict the cost of living in the many thousands of school districts in the Nation for which ACCRA values do not exist. The school districts are ranged along the horizontal axis, from the lowest actual COL on the left to the highest on the right. Figure 1 reveals that the model does a reasonably good job of predicting the cost of living, with

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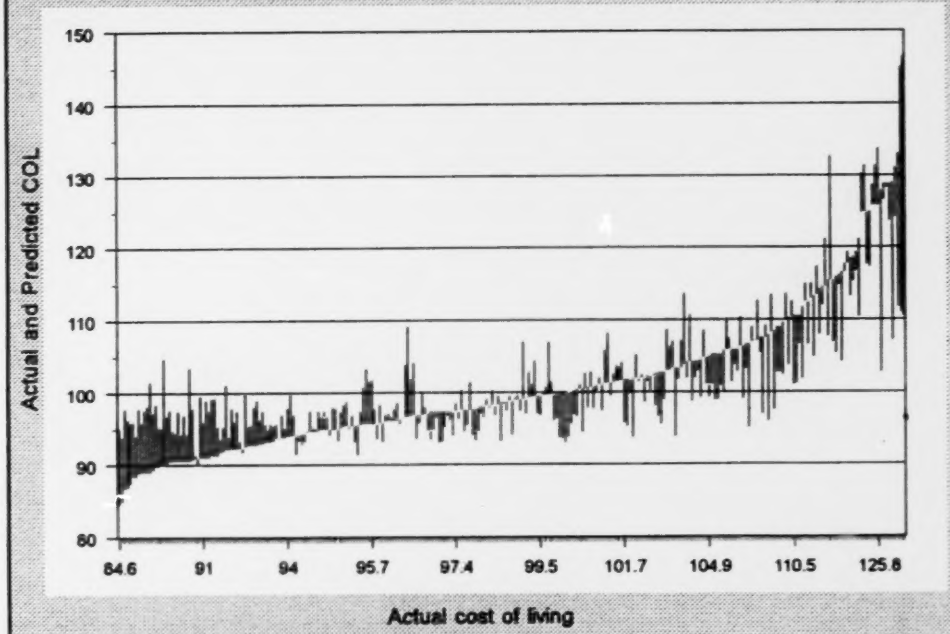
[3] This comparison may be obtained from the author on request.

Figure 1.—Differences between actual and predicted costs of living in 293 selected school districts: United States, 1990



SOURCE: Actual: ACCRA (1994), for 1990. Predicted: Eq.(6), using McMahon (1995).

some underprediction in the lowest-COL districts and the largest errors tending to occur in the highest property value largest PMSAs, which are generally to the right on the graph. The largest prediction errors are for Philadelphia, for Kodiak Island in the Aleutian chain in Alaska, and for Fairbanks. In each of these cases, the ACCRA COL value is considerably above the predicted value, which is based primarily on the somewhat lower-than-average cost of housing in these places. The theory presented earlier would suggest that the cost of transportation to the distant parts of Alaska could help to explain the high prices and price inelasticity of all items (for resupply) and hence higher living costs in these (and similar) locations. Philadelphia has higher urban living costs but some relatively less highly valued housing. The prediction error for this city could reflect the high cost of urban living for low-income people with modest housing assessments.

National and Intrastate COL Differences Among School Districts

Model-predicted values for differences in the cost of living among school districts within a state are illustrated in Table 2, and differences in the costs of education based on a variant of these are shown in Table 3. Differences among states in these costs are shown in Table 4.

Table 2.— Cost of living index 1990. Predicted and normalized values for the 15 highest-cost, 15 middle-cost, and 15 lowest-cost school districts, U.S. census classification, county, county population, value of housing, and per capita income by school district: Illinois, 1990

County	School District	Census classification of area	Population of county 1990	Population of county 1980	Average value of housing (in thousands)	Per capita income (in thousands)	Predicted COL percent	Normalized COL percent
Highest cost of living								
Du Page	H-1	MSA*	781,666	658,858	$496.43	$72.05	179.86	178.09
Cook	H-2	MSA	5,105, 067	5,253,628	483.78	61.68	176.54	174.81
Lake	H-3	MSA	516,418	440,397	453.85	31.77	171.47	169.79
Cook	H-4	MSA	5,105,067	5,253,628	423.36	59.50	165.51	163.88
Lake	H-5	MSA	516,418	440,397	397.29	41.67	161.31	159.72
Cook	H-6	MSA	5,105,067	5,253,628	362.45	51.60	154.30	152.78
Cook	H-7	MSA	5,105,067	5,253,628	339.93	49.07	150.16	148.68
Cook	H-8	MSA	5,105,067	5,253,628	332.30	37.45	148.60	147.14
Lake	H-9	MSA	516,418	440,397	316.97	36.07	146.60	145.15
Cook	H-10	MSA	5,105,067	5,253,628	302.44	39.20	143.19	141.78
Cook	H-11	MSA	5,105,067	5,253,628	283.68	38.39	139.76	138.38
Lake	H-12	MSA	516,418	440,397	273.86	38.85	138.78	137.42
Lake	H-13	MSA	516,418	440,397	270.49	51.23	138.34	136.98
Cook	H-14	MSA	5,105,067	5,253,628	275.62	37.93	138.28	136.92
Du Page	H-15	MSA	781,666	658,858	267.62	25.17	137.51	136.15
Middle cost of living								
Tazewell	M-1	MSA	123,692	132,078	54.40	13.12	97.49	96.53
Cook	M-2	MSA	5,105, 067	5,253,628	53.79	9.61	97.47	96.51
La Salle	M-3	Nonmetropolitan	106,913	112,033	53.72	13.43	97.44	96.48
Sangamon	M-4	MSA	178,386	176,070	52.24	13.11	97.40	96.44
Grundy	M-5	Nonmetropolitan	32,337	30,582	51.20	12.38	97.38	96.42
La Salle	M-6	Nonmetropolitan	106,913	112,033	53.49	11.88	97.38	96.42
Clinton	M-7	MSA	33,944	32,617	51.67	10.54	97.37	96.41
Macon	M-8	MSA	117,206	131,375	54.59	14.84	97.37	96.41
Menard	M-9	MSA	11,164	11,700	53.27	13.29	97.36	96.40
St. Clair	M-10	MSA	262,852	267,531	52.77	11.71	97.35	96.40
Washington	M-11	Nonmetropolitan	14,965	15,472	53.07	12.07	97.35	96.40
McLean	M-12	MSA	129,180	119,149	50.06	13.81	97.30	96.34
Peoria	M-13	MSA	182,827	200,466	53.89	13.17	97.30	96.34
Cook	M-14	MSA	5,105,067	5,253,628	52.55	13.02	97.29	96.33
Champaign	M-15	MSA	173,025	168,392	51.18	10.45	97.23	96.27
Lowest cost of living								
Mercer	L-1	Nonmetropolitan	17,290	19,286	22.84	10.51	91.54	90.64
Pike	L-2	Nonmetropolitan	17,577	18,896	21.84	10.70	91.50	90.60
Fulton	L-3	Nonmetropolitan	38,080	43,687	23.02	10.64	91.48	90.58
Johnson	L-4	Nonmetropolitan	11,347	9,624	15.98	8.91	91.40	90.50
St. Clair	L-5	MSA	262,852	267,531	20.42	5.37	91.37	90.47
Pike	L-6	Nonmetropolitan	17,577	18,896	20.40	9.80	91.22	90.32
Pike	L-6	Nonmetropolitan	17,577	18,896	20.40	9.80	91.22	90.32
Pulaski	L-8	Nonmetropolitan	7,523	8,840	22.23	7.37	91.20	90.31
Bureau	L-9	Nonmetropolitan	35,688	39,114	20.56	7.64	91.15	90.25
White	L-10	Nonmetropolitan	16,522	17,864	19.64	10.05	91.07	90.17
Alexander	L-11	Nonmetropolitan	10,626	12,264	20.38	8.09	90.94	90.04
Jefferson	L-12	Nonmetropolitan	37,020	36,558	17.08	9.10	90.94	90.04
Hancock	L-13	Nonmetropolitan	21,373	23,877	19.38	9.78	90.89	90.00
Hancock	L-14	Nonmetropolitan	21,373	23,877	18.05	9.36	90.65	89.75
Fulton	L-15	Nonmetropolitan	38,080	43,687	17.59	10.17	90.48	89.59

* Metropolitan statistical area

SOURCE: McMahon (1995).

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Table 3.— Predicted and normalized educational cost differences as a percentage of the statewide mean of 100 percent, by county, county population, average value of housing, and per capita income: Illinois, 1990

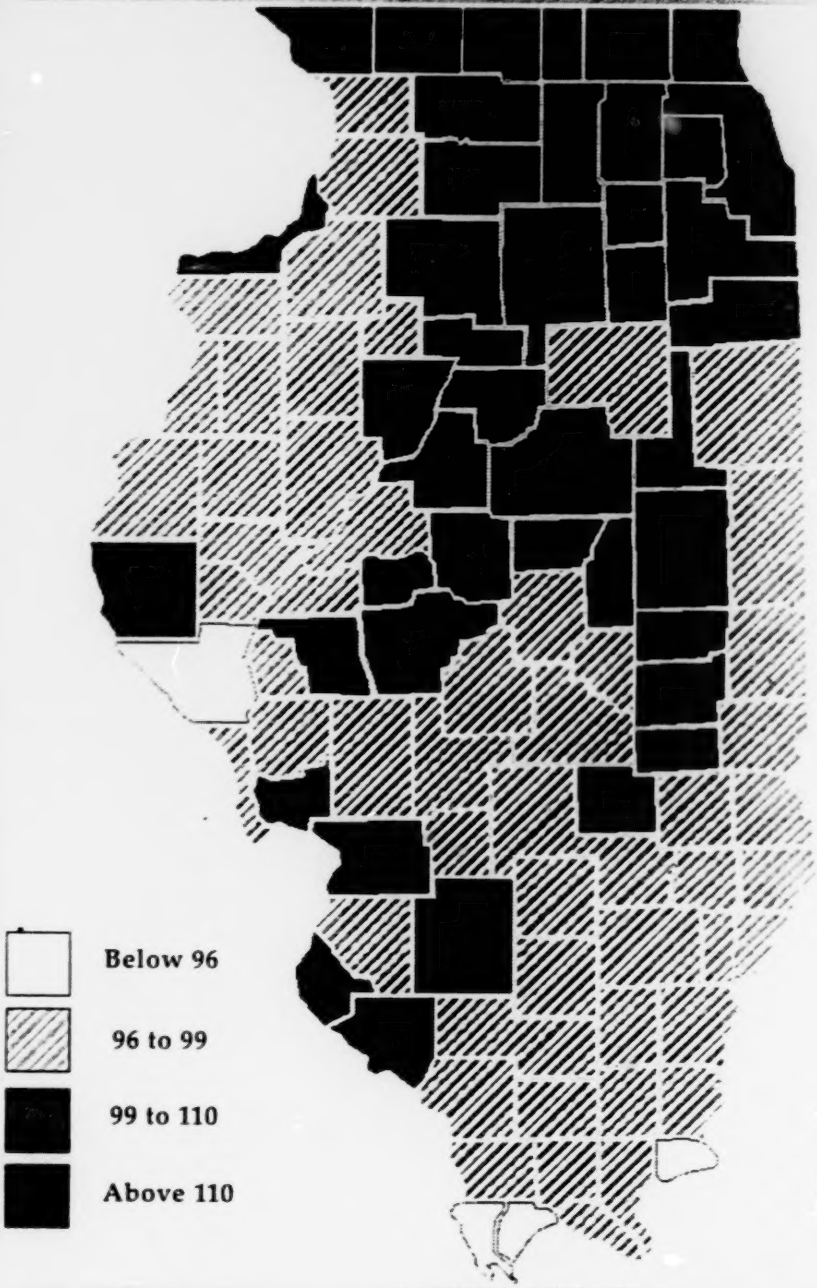
County	Population 1990	 1980	Average value of housing (in thousands)	Per capita income (in thousands)	Cost of education	Normalized cost of education
Lake	516,418	440,397	$160.99	$22.55	$116.93	$121.17
Du Page	781,666	658,858	151.47	21.83	114.64	118.79
McHenry	183,241	147,897	110.04	17.03	109.08	113.03
Kane	317,471	278,405	124.36	17.74	108.44	112.37
Cook	5,105,067	5,253,628	125.21	19.07	107.36	111.24
Kendall	39,413	37,202	86.44	14.88	105.88	109.71
Will	357,313	324,460	90.51	15.04	104.28	108.05
Champaign	173,025	168,392	60.78	12.61	104.08	107.85
De Kalb	77,932	74,624	81.73	13.77	103.17	106.90
Grundy	32,337	30,582	74.46	14.30	102.48	106.19
Winnebago	252,913	250,884	67.43	15.10	101.73	105.41
Monroe	22,422	20,117	64.45	13.38	100.98	104.63
Boone	30,806	28,630	66.81	14.43	100.45	104.08
McLean	129,180	119,149	56.45	14.15	100.11	103.73
Rock Island	148,723	165,759	48.58	12.75	99.58	103.18
Sangamon	178,386	176,070	63.57	14.73	98.94	102.52
Woodford	32,653	33,320	56.55	13.57	98.66	102.24
St. Clair	262,852	267,531	64.02	13.61	98.57	102.14
Adams	66,090	71,622	38.30	10.45	98.40	101.96
Ogle	45,957	46,338	57.10	12.89	98.17	101.73
Clinton	33,944	32,617	55.01	10.99	98.11	101.66
Stephenson	48,052	49,536	50.02	13.32	97.73	101.27
Effingham	31,704	30,944	49.18	11.01	97.71	101.25
Menard	11,164	11,700	53.07	13.12	97.62	101.15
Kankakee	96,255	102,926	55.36	11.69	97.59	101.12
Madison	249,238	247,661	46.57	12.16	97.29	100.81
Jackson	61,067	61,649	46.51	10.68	97.15	100.67
Coles	51,644	52,260	41.36	11.22	97.13	100.65
Logan	30,798	31,802	52.18	11.24	96.93	100.44
La Salle	106,913	112,033	54.92	12.68	96.83	100.33
Piatt	15,548	16,581	44.73	12.95	96.79	100.30
Peoria	182,827	200,466	52.01	13.99	96.42	99.91
Jo Daviess	21,821	23,520	47.77	12.64	96.41	99.90
Morgan	36,397	37,502	38.42	11.99	96.39	99.88
Livingston	39,301	41,381	48.37	12.23	96.38	99.87
Tazewell	123,692	132,078	50.52	14.03	96.35	99.84
Lee	34,392	36,328	45.25	12.39	96.20	99.69
Washington	14,965	15,472	44.74	11.35	96.09	99.57
Putnam	5,730	6,085	46.28	13.10	96.03	99.50
Randolph	34,583	35,652	44.52	11.34	96.02	99.50
Douglas	19,464	19,774	43.68	11.19	95.98	99.46
Jersey	20,539	20,538	44.49	10.68	95.91	99.38
De Witt	16,516	18,108	46.07	12.66	95.75	99.22
Marshall	12,846	14,479	44.95	12.63	95.71	99.18
Bureau	35,688	39,114	37.86	11.18	95.57	99.03
Whiteside	60,186	65,970	44.51	11.83	95.48	98.94
Jefferson	37,020	36,558	41.35	11.09	95.44	98.89
Wabash	13,111	13,713	41.55	10.97	95.39	98.84
Perry	21,412	21,714	40.27	11.24	95.31	98.76
Macon	117,206	131,375	49.19	14.41	95.31	98.76
Williamson	57,733	56,538	38.75	10.85	95.19	98.64
Moultrie	13,930	14,546	39.72	11.77	95.07	98.51
Ford	14,275	15,265	38.24	12.84	95.02	98.46
Henry	51,159	57,968	38.41	11.89	95.01	98.45
Macoupin	47,679	49,384	38.92	11.31	94.98	98.42
Johnson	11,347	9,624	32.75	9.21	94.92	98.36

Table 3.— Predicted and normalized educational cost differences as a percentage of the statewide mean of 100 percent, by county, county population, average value of housing; and per capita income: Illinois, 1990 (Continued)

County	Population 1990	Population 1980	Average value of housing (in thousands)	Per capita income (in thousands)	Cost of education	Normalized cost of education
Jasper	10,609	11,318	$40.34	$10.24	$94.89	$98.32
Bond	14,991	16,224	34.67	10.40	94.84	98.28
Iroquois	30,787	32,976	38.93	11.29	94.74	98.17
Cumberland	10,670	11,062	38.88	10.52	94.68	98.10
McDonough	35,244	37,467	32.06	10.25	94.63	98.06
Vermilion	88,257	95,222	39.63	11.54	94.60	98.02
Union	17,619	17,765	37.08	10.30	94.57	97.99
Carroll	16,805	18,779	40.11	12.12	94.56	97.98
Knox	56,393	61,607	38.37	11.99	94.35	97.76
Christian	34,448	36,446	36.14	11.38	94.33	97.74
Shelby	22,261	23,923	34.70	11.06	94.25	97.66
Montgomery	30,728	31,686	33.82	10.58	94.21	97.62
Mercer	17,290	19,286	34.10	12.06	94.19	97.60
Marion	41,561	43,523	33.26	10.79	94.14	97.54
Massac	14,752	14,990	30.88	10.10	94.13	97.54
Schuyler	7,498	8,365	36.62	10.07	94.04	97.45
Crawford	19,464	20,818	33.03	11.17	94.01	97.41
Richland	16,545	17,587	33.23	11.84	94.01	97.41
Wayne	17,241	18,059	36.52	10.44	93.99	97.39
Calhoun	5,322	5,867	36.68	9.51	93.92	97.32
Clark	15,921	16,913	32.81	11.16	93.89	97.29
Fayette	30,893	22,167	31.57	10.13	93.79	97.19
Edgar	19,595	21,725	33.14	11.42	93.74	97.13
Mason	16,269	19,492	34.44	11.12	93.68	97.07
Edwards	7,440	7,961	33.70	10.95	93.68	97.07
White	16,522	17,864	28.84	10.67	93.53	96.92
Gallatin	6,909	7,590	33.42	10.44	93.52	96.91
Brown	5,836	5,411	29.79	8.89	93.51	96.90
Saline	26,551	28,448	32.01	9.73	93.50	96.89
Scott	5,644	6,142	32.07	10.46	93.44	96.83
Hancock	21,373	23,877	30.47	10.98	93.42	96.80
Warren	19,181	21,943	33.28	10.80	93.39	96.77
Henderson	8,096	9,114	32.94	10.43	93.35	96.73
Cass	13,437	15,084	33.27	10.99	93.32	96.70
Lawrence	15,972	17,807	32.17	10.29	93.28	96.66
Clay	14,460	17,807	30.20	9.18	93.18	96.55
Fulton	38,080	43,687	28.71	10.33	93.11	96.48
Pope	4,373	4,440	29.39	8.98	93.10	96.47
Stark	6,534	7,389	31.65	10.87	93.05	96.42
Franklin	40,319	43,201	30.45	10.10	93.01	96.38
Greene	15,317	16,661	30.87	10.19	92.78	96.14
Hamilton	8,499	9,172	28.37	10.00	92.66	96.02
Pike	17,577	18,986	24.81	10.22	92.60	95.95
Hardin	5,189	5,383	25.26	8.36	92.22	95.56
Pulaski	7,523	8,840	23.73	9.14	91.41	94.72
Alexander	10,626	12,264	22.58	8.53	91.27	94.57
unweighted mean, statewide						100

SOURCE: McMahon (1995).

Figure 2.— Cost of living index by county: Illinois, 1990


Below 96
96 to 99
99 to 110
Above 110

SOURCE: McMahon (1995).

Table 4.— Cost of living by state: 1990

State	Predicted cost of living	Normalized cost of living
United States	105.12	100.00
Alabama	95.77	91.11
Alaska	115.66	110.03
Arizona	103.68	98.63
Arkansas	93.47	88.92
California	126.87	120.69
Colorado	103.21	98.19
Connecticut	127.77	121.55
Delaware	113.07	107.56
District of Columbia	116.17	110.51
Florida	103.25	98.22
Georgia	99.18	94.35
Hawaii	133.22	126.73
Idaho	99.16	94.33
Illinois	105.24	100.11
Indiana	97.78	93.02
Iowa	96.66	91.95
Kansas	97.23	92.49
Kentucky	96.74	92.03
Louisiana	95.46	90.81
Maine	110.32	104.95
Maryland	116.85	111.15
Massachusetts	125.25	119.15
Michigan	99.92	95.06
Minnesota	101.00	96.08
Mississippi	93.86	89.29
Missouri	98.45	93.65
Montana	99.50	94.65
Nebraska	94.54	89.93
Nevada	108.67	103.38
New Hampshire	118.98	113.18
New Jersey	124.48	118.41
New Mexico	100.40	95.51
New York	122.54	116.57
North Carolina	97.96	93.19
North Dakota	96.59	91.88
Ohio	101.11	96.18
Oklahoma	94.20	89.61
Oregon	102.61	97.61
Pennsylvania	111.38	105.95
Rhode Island	113.73	108.19
South Carolina	97.29	92.55
South Dakota	94.15	89.56
Tennessee	95.90	91.23
Texas	97.59	92.84
Utah	101.95	96.98
Vermont	107.31	102.08
Virginia	112.60	107.12
Washington	107.86	102.61
West Virginia	94.34	89.74
Wisconsin	99.81	94.95
Wyoming	100.29	95.41

SOURCE: McMahon (1995).

Intrastate COL Differences Among School Districts

Differences in the cost of living for the 15 highest-COL, 15 medium-COL, and 15 lowest-COL school districts in Illinois in 1990 are shown in Table 2, some in PMSAs, some in MSAs, and some in nonmetropolitan areas. First, the predicted cost of living is shown, and then, in the last column, it is normalized to a statewide mean of 100 within the state.

It is not possible to show all estimated values, even for one state, because there are about 900 school districts in Illinois alone and 14,300 in the nation. However, the patterns that can be observed in Table 2 are typical for other states. The complete data set reporting the cost of living and per capital personal income for school districts nationwide, as well as county and state cost indices, is available on diskette from NCES' National Data Resource Center (NDRC).[4]

For Illinois, (see Figure 1), the highest living costs are predicted for Du Page and Lake counties, which are high-income suburbs of Chicago, with values ranging from about 40 to 30 percent (or in the most extreme case, 78 percent) above the statewide norm. All of the predicted values of the cost of living substitute the ACCRA COL values, where they exist, since the latter are based on direct measures of actual price data in those localities. However, the ACCRA sample in a particular county is sometimes not representative, however. In these cases, the predicted values based on the census data for all school districts within the county can serve as a cross-check.

It will be noted in some school districts in Du Page County and Lake County, the average value of houses ranges from $268,000 to $496,000. It is doubtful in these

The complete data set reporting the cost of living and per capital personal income for school districts nationwide...is available on diskette from NCES' National Data Resource Center (NDRC).[4]

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[4] Requests may be sent to the National Data Resource Center, (

, (703) 845-3151 or NDRC@inet.ed.gov

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Table 3 presents a measure of the cost of living within the county that also can be considered to be an estimate of the cost of education for the school districts in that county.

cases that the district's teachers, school administrators, or maintenance personnel live within the district, even though in some districts this is a requirement for employment. In this event, although the cost of living may be high, the costs associated with the provision of education in those districts is not as high. Similarly, the true costs in some of the lowest-COL districts may be understated, since teachers who agree to teach there also live outside the district.

Education Costs and County-Wide Cost of Living

When considering intrastate differences in the cost of education based on inputs purchased by school districts, it will be assumed that school personnel normally live not only within the district but also in nearby districts within the same county, and that school districts also purchase some of their other inputs within the county, but outside of the district. Table 3 presents a measure of the cost of living within the county that also can be considered to be an estimate of the cost of education for the school districts in that county. The predicted values are based on the housing values in all school districts within each county, the county-wide per capita personal income, and population change.

The county-wide predicted cost of living (or educational cost), however, is computed by obtaining a population-weighted mean of the COL measures for each school district within that county. Based on this, the normalization procedure then computes an unweighted mean, which is more meaningful in this case than a weighted mean, for reasons that are discussed below. Because of the effect of this county-wide population-weighted averaging, the normalized educational cost differences among school districts are not as extreme, ranging from 121.17 in the districts in the highest-cost counties to 94.57 in the school district facing the lowest costs.

Note that in Column 1, in both Tables 2 and 3, the highest COLs and school district costs are not in PMSAs, but instead in suburban MSAs, and the lowest costs are generally found in the nonmetropolitan areas.

Interstate Differences in Costs

Differences in costs among states based on the local COL for all school districts within each state, with the averages weighted by the population of each school district, are shown in Table 4. These then are normalized to relate to a nationwide base of 100 in the last column.

The normalization procedure for school districts (Table 2), for counties (Table 3), and for states (Table 4) takes the simple unweighted mean of all units within each larger jurisdiction as a base to get the normalized index, each index number relating to a base of 100 for the jurisdiction. This is because it is more meaningful to express the index for all persons living within a given county (or other unit) in relation to the costs faced by persons living within other counties, and not in relation to all persons in the state, many of whom may live within the same (larger) county. This is in sharp contrast to the county-wide COL index, which is a population-weighted mean of the school districts within that county, and to the statewide index, which in effect weights the index for each county by its population.

Considering the results for the cost of living by states, the variation among states using these new census data is not identical but similar to estimates made previously (McMahon 1991). It is not precisely identical, because this new estimate is based on the weighted means of very specific school-district-level data, whereas earlier estimates started with county-wide data.

Table 4 shows the variation in the cost of living, which on a statewide basis is also one estimate of the variation in the cost of education, to be from 126.73 in Hawaii to 89.29 in Mississippi. As one might expect, Connecticut, New Jersey, California, and Massachusetts are high-cost areas, and Mississippi, West Virginia, and South Dakota are low-cost areas.

Table 5 illustrates how, for a statewide index calculation (for Alaska), a population-weighted index is necessary. The higher cost indices for Anchorage, Fairbanks, Juneau, Ketchikan, and Kodiak are swamped by the lower-cost, largely rural areas, which are more numerous unless a population-weighted index is used for the state as a whole.

Table 5.— Cost of living in Alaska, by school districts

Location	Type	School District	COL ACCRA	Predicted COL	Normalized COL
Anchorage	MSA	A		$110.62	$103.53
Bethel	Non-Met	B		110.86	94.40
Bethel	Non-Met	C		99.64	93.26
Bethel	Non-Met	D		97.94	91.67
Bristol Bay	Non-Met	E		108.92	101.94
Bristol Bay	Non-Met	F		96.71	90.52
Dillingham	Non-Met	G		108.77	101.80
Fairbanks North	Non-Met	H		105.21	98.47
Fairbanks North	Non-Met	I	129.0	129.00	120.74
Haines	Non-Met	J		105.86	99.07
Juneau	Non-Met	K	133.0	133.00	124.48
Ketchikan Gateway	Non-Met	L	146.4	146.40	137.02
Kodiak Island	Non-Met	M	145.0	145.00	135.71
Matanuska-Sustina	Non-Met	N		107.36	100.48
Nome	Non-Met	O		98.08	91.80
Nome	Non-Met	P		105.53	98.77
Sitka	Non-Met	Q		111.53	104.38
Skagway-Yakutat	Non-Met	R		101.89	95.36
Southeast Fairbanks	Non-Met	S		96.47	90.29
Wade Hampton	Non-Met	T		104.30	97.62
Unweighted mean, statewide				106.84	100.00

NOTE: ACCRA = American Chamber of Commerce Research Association. COL = cost of living.

SOURCE: McMahon (1995).

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A government-services index tends to be less relevant for schools, since it reflects prevailing wages of largely blue-collar service workers, whereas education is more human-capital intensive.

Summary of Conclusions

National estimates of intrastate geographic differences in the cost of living among school districts and of education cost differences among counties can be based on the 1990 census data that the NCES has mapped for each school district.[5] Living costs range from about +78 percent in the highest school district MSAs to -11 percent in the lowest-cost nonmetropolitan school districts within each state. Education cost differences based on COL differences for the wider county-wide population-weighted average of the more localized school district areas are not as large (+21 percent to -6 percent in Illinois) as might be expected.

The rationale for using the COL of persons typical of teachers and school principals as an estimate of education costs is that salary costs plus benefits constitute about 80 percent of school budgets and are correlated with the rest. Also county-wide prices are not subject to manipulation by local districts or state-level interest groups where a cost index is being considered for use in making regional cost reimbursements. That is, a county-wide index avoids using costs such as teacher salaries that are endogenous to each district, which would likely encourage the school district to raise these costs when requested by employee groups, or not consolidated if a TCI were used, since they would be reimbursed. This is characteristic of cost-based reimbursement, which encourages not only higher prices, but also overutilization and other inefficiencies. A county-wide index also does not involve equity factors related to special local education needs. In economic theory, these needs and the degree of response to them are largely determined on the demand side and should be the focus of a separate policy decision concerning pupil weightings. A government-services index tends to be less relevant for schools, since it reflects prevailing wages of largely blue-collar service workers, whereas education is more human-capital intensive.

The use of any cost indices to make regional cost adjustments of state aid payments to local schools and welfare payments, for example, without making compensating changes in the financial transfer mechanisms, raises other kinds of problems. To preserve equity between low-income rural districts and the wealthier suburbs when regional cost reimbursements are introduced, it would be appropriate to move to a more economically sensible measure of effort in the school aid formula than the property tax mileage rate applied to equalized assessed property valuations. Property is a very narrow and inadequate measure of total family income or wealth in an industrialized society, so use of this measure, even though it is a "tax handle," leads to gross distortions (McMahon 1978). Per capita personal income is a much better measure of true ability to pay, since it reflects the earnings from human capital and interest and profits from financial assets, as well as real estate. Measures of personal income per capita from the 1990 census as in Table 2 are available in McMahon (1995) for every school district in the nation, based on the NCES mapping.

It is suggested, therefore, that the method presented here be used to explore equity in expenditure per pupil, further refinements to nonmonetary amenities, and efficiency together with school district budget data. At the same time, other features of the aid formula can be reviewed and corrected, particularly the measure of local fiscal effort. Eventually, consensus will be reached on the most appropriate method for measuring the cost of education for making regional cost reimbursements in aid formulas and, the author hopes, simultaneous changes in measures of local effort that more accurately reflect households' true ability to pay. Together, these can contribute to greater accuracy in measurement, incentives for efficiency, and greater pupil equity.

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[5] As noted earlier, the only exceptions are due to missing data for a few school districts in New Jersey, New York, and California.

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Costs of Measuring and Providing Opportunity to Learn: Preliminary Thoughts

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Selected
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Costs of Measuring and Providing Opportunity to Learn: Preliminary Thoughts

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Opportunity-to-learn standards were projected onto the education agenda only recently. This concept generally concerns the activities and processes of classroom and school behavior relative to student achievement—that is, what is taught and how it is taught (Porter 1993b)—although, in a broader construct called "school delivery standards," it can comprise a broader range of issues that include school organization and culture (Darling-Hammond 1992). Until these standards were catapulted into the nation's policy agenda, the notion of opportunity to learn was discussed mainly within specialized areas of educational research. Those who studied student assessment results, for example, claimed that a large portion of differences in student learning could be attributed to variations in curriculum content exposure (opportunity to learn) (Porter 1993b, Schmidt 1983, Sebring 1987). But, in the 1980s, as education policy switched from an input orientation to a results orientation (National Governors' Association 1986), the concept of opportunity to learn leaped from the arcane halls of education research into the politically charged arena of public policy.

The results orientation of new education policy not only claimed that results—what students know and are able to do—are the key dimension of equal educational opportunity, but that students, as well as schools and school districts, should be held accountable for results—that high stakes should be attached to student performance. High stakes could mean promotion from one school level to another (elementary to middle school, for example), admission to postsecondary education, or position and salary in the labor force. As this accountability dimension was added to the new results orientation, the opportunity-to-learn issue arose. If students were held accountable, the argument went, they would need the same opportunity to learn. A level playing field would be needed to make the consequences of the new policy orientation fair. How could all students be held to the same learning standards, it was argued, if some students attended schools in low-spending districts with lower quality education services and less expert teachers and were not taught a thinking-oriented curriculum?

These issues quickly became the subject of debate and analysis within the education policy analysis community (Darling Hammond 1992, Porter 1993b). The same issues became hotly contested within the education policymaking community after the

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One reason the current policy transition to results is somewhat unsettling is that it occurs after nearly a century of focus on inputs.

Clinton Administration submitted its education reform bill, Goals 2000: Educate America Act, to Congress. As a condition of their initial support, several Democrats in the U.S. House of Representatives demanded that the bill include a requirement for states to develop and implement school-delivery standards before results standards could be implemented. To some individuals, such a requirement evoked a vision of more detailed input and process regulations at a time when the education policy system was trying to break away from inputs and focus on outputs, particularly student achievement.

Somewhat lost in these debates was a clear understanding of how opportunity-to-learn standards could be defined and measured, then implemented. This paper addresses these issues, with a focus on the costs of both gathering and implementing opportunity-to-learn standards. The first section provides a conceptual and historical framework within which opportunity-to-learn standards can be defined and identifies several variables that could be selected to represent opportunity to learn. The second section discusses the costs of obtaining measures for these variables and the last section makes some preliminary comments on the costs of implementing opportunity to learn.

The Struggle for Opportunity to Learn

Although recent discussions appear to make opportunity to learn a brand-new issue, Elmore and Fuhrman (1993) demonstrate that states have been trying to provide opportunity to learn on a level playing field during much of the previous 2 centuries. Both concepts include several dimensions of the Nation's efforts to create a common public school system out of the disparate and largely private education system the country had at its birth. Further, it can be argued that both concepts have their roots in various state education clauses and that current deliberations over opportunity to learn are simply the most recent and visible attempts to define and give meaning to those vague phrases requiring "general and uniform," "thorough and efficient," or just plain "free common school" education systems. In a real way, opportunity to learn is the 1990s version of the 1960s phrase "equal education opportunity." While opportunity to learn explicitly includes educational process and student results, the implicit goal of both, as well as of state education clauses, is arguably the same: good education for all children.

One reason the current policy transition to results is somewhat unsettling is that it occurs after nearly a century of focus on inputs. Elmore and Fuhrman's discussion of the historical evolution of the state in providing an equal education program illuminates this point. At the turn of the century, opportunity to learn was embodied in state efforts to create the common school system required by new state education clauses. Thus, states enacted regulations for certifying teachers, accrediting schools, and financing districts according to common, statewide standards.

From about 1920 to 1950, the quest for equal educational opportunity focused on school finance equalization. Primarily through minimum foundation general aid programs, the goal was to provide all school districts with a minimum level of dollars per pupil that would allow them to provide an adequate education program (Odden and Picus 1992).

The next state effort was to consolidate school districts into larger bodies, both to expand and improve, and to make more equitable the education program offered and to make the overall system more efficient. As a result, between 1900 and 1950, the number of school districts dropped from over 130,000 to 84,000; that number dropped to 18,000 by 1970.

In the 1960s and 1970s, the quest for opportunity to learn broadened to include special-needs students. States and the federal government created numerous categorical programs to desegregate students, educate the disabled, serve the economically disadvantaged, and meet the needs of limited-English-proficient (LEP) students. The goal was to provide additional educational services to help ensure that these special-needs students would achieve on a level with the "regular" student (Odden and Picus 1992).

The next step in the 20th-century journey toward opportunity to learn was a renewed school finance reform in the 1970s and 1980s. Emboldened by legal challenges that overturned improved but still inequitable school finance structures, this effort sought to move beyond providing a minimal educational opportunity to creating an overall fiscally neutral system in which all districts would operate as if they had the same local property tax base (Coons, Clune, and Sugarman 1969). In response, states enacted new power-equalizing school finance systems, as well as higher-level foundation programs (Odden and Picus 1992).

While none of these embodiments of equal educational opportunity or opportunity to learn explicitly mentioned student achievement, a reasonable argument was that better achievement was implicitly its objective. Indeed, the original goal of the special-needs programs was to reduce income inequality by raising the educational achievement and thus the earning potential of children from poverty backgrounds (Murphy 1991). While ambitious in its aims, the goal nevertheless was achievement-oriented. School finance reformers often ducked the outcomes issue, but they believed that the quality of the education program and the level of student achievement were determined by spending levels (Coons, Clune, and Sugarman 1969). Further, the consolidation movement was fueled by a desire to ensure that rural children be as well educated as their urban peers.

The explicit transition of equal education opportunity to a results orientation began in the 1970s with the minimum competency movement. During this period, many states enacted laws to ensure that all students learned basic skills and created state testing systems to measure student achievement in reading and mathematics. When some states made passing such a test a requirement for high school graduation, courts ruled (as in *Debra P. v. Turlington*, 474 F. Supp. 244 [M.D. Fla. 1979]) that the requirements had to be phased in gradually so that students would have an opportunity to learn the material before taking the new high school tests, which held real consequences for them.

As the 1980s unfolded, dissatisfaction with minimum skills grew, and the education excellence movement was launched (Murphy 1990). Although fueled by dissatisfaction with the level of student achievement (National Commission on Excellence in Education 1983), the 1980s state education reforms nevertheless were heavily input-oriented and generally stiffened and strengthened input standards: course content, unit requirements for high school graduation, conditions and knowledge requisites for teacher licensure, and alignment of curriculum, texts, and student tests (Murphy 1990).

However, this movement quickly turned itself into an explicit focus on student achievement as the realization dawned on some that results were indeed the primary objective (National Governors' Association 1986) and that student achievement was inadequate (Applebee, Langer, and Mullis 1989; LaPointe, Mead, and Phillips 1989). As the end of the 1980s drew near, the President and the Nation's governors adopted the first national education goals ever to be explicitly results oriented, with Goal 3 requiring proficiency in the complex subjects of mathematics, science, language arts,

School finance reformers often ducked the outcomes issue, but they believed that the quality of the education program and the level of student achievement were determined by spending levels.

The dilemma is that simply focusing on and measuring student achievement does not necessarily improve it.

civics, and geography, and Goal 4 requiring U.S. students to be first in the world in mathematics and science achievement.

Setting student achievement results as the key focus for the education system is an important first step. The challenge, of course, is how to structure policy and program systems to produce results. Moreover, as Elmore and Fuhrman note (1993), even after an 84-year focus on equalizing inputs, fiscal disparities have not been eliminated; indeed, in the early 1990s, more than half of the states were embroiled in intense school finance court suits precisely because large disparities in fiscal capacity and educational expenditures per pupil still existed across school districts (Dively and Hickrod 1993). Further, as the results focus narrowed, equally large—some felt intractable—differences in educational achievement appeared between minority and other students (Mullis et al. 1990), low-income and other students (Mullis et al. 1990), and girls and boys (Mullis et al. 1990), as well as among the 50 states (Mullis et al. 1991; Mullis, Campbell, and Farstrup 1993), including rich and poor states (Odden and Kim 1992).

The dilemma is that simply focusing on and measuring student achievement does not necessarily improve it. The intermediate step of focusing on educational processes, while promising (Porter 1993b) in terms of identifying new variables strongly linked to student achievement, still sounds like more sophisticated input and not a results orientation. Moreover, as Elmore and Fuhrman note (1993), simply abandoning any concern with inputs defies common sense because student achievement equity, particularly the current goal to educate all students to high standards, seems unattainable with the rampant disparities in fiscal resources that currently exist in most states (Hertert, Busch, and Odden 1994; Wykoff 1992).

Opportunity-to-Learn Variables

At this point, decisions about a set of opportunity-to-learn variables that could be measured and collected should take a broad rather than a narrow perspective, somewhat reminiscent of an educational indicators approach (Porter 1991). The notion is to be as parsimonious as possible in deciding what variables to collect but not to limit the scope of variables so narrowly as to prematurely eliminate important factors that might be strongly connected to student learning.

A wide range of categories of variables (Darling-Hammond 1992), as well as of specific variables in each category could be justified. Two principles guide the selection of both categories and specific variables: parsimony and a research connection to student achievement. The following suggests collecting variables to represent opportunity to learn in three specific categories: fiscal, educational process, and teacher quality.

The first category of opportunity-to-learn variables is fiscal variables, which (still) vary dramatically across states (Barro 1992b), across state districts (Hertert, Busch, and Odden 1994; Wykoff 1992), and across district schools (Hertert 1993). Although traditional research finds weak, if any, connections of dollars to achievement (Hanushek 1989), recent analyses find much stronger links (Ferguson 1991; Monk 1992; Laine, Hedges, and Greenwald 1993).

The second category of opportunity-to learn variables is educational process. Research documents strong impacts on student learning for such variables as the proportion of instruction time actually spent on instruction; high school course-taking patterns; college entrance requirements; and enacted curriculum, related pedagogy, and instructional resources (Porter 1993a).

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The third category of opportunity-to-learn variables describes teacher knowledge, skills, and disposition—another set of factors that determine the extent to which all students can achieve at high levels (Darling-Hammond 1992, 1993).

Attention is given to variables that are connected to student achievement and to variables that are either in the process of being collected or that could be included with modest additional federal or state data collection efforts. Since a long article could be written on the potential of any variable within each of the above three categories, the following is simply a list of some key variables that could be selected. This list should in no way be viewed as exhaustive but as a group of categories and variables that could form a beginning set of opportunity-to-learn variables. Where possible, the variables are identified, then different measures of those variables are described.

Fiscal Variables

Several variables could be identified as fiscal measures of opportunity to learn. Those variables could include revenues and expenditures per pupil. Since the two are strongly linked, expenditures could comprise the variable selected. Within expenditures, there could be several specific variables: total current operating expenditures per pupil, core educational expenditures per pupil (broader than just instructional expenditures but narrower than total current operating expenditures), and instructional expenditures per pupil. If revenues were selected, the largest variable would be total federal, state, and local operating revenues; more restricted figures would include state and local revenues, then state general aid and local revenues, that is, state and local revenues excluding categorical aids. For each variable, three key statistics could be calculated to indicate the degree of inequality: the federal range ratio (used in the Federal Impact Aid program [Odden 1993]), the coefficient of variation, and the McLoone index,[1] which provides a measure of dispersion for the bottom 50 percent of all districts (Berne and Stiefel 1984; Odden and Picus 1992). Since data are collected at the district level, these all would be district-level measures; the goal over time would be to collect such measures at the individual school site level.

Before statistics are calculated, it would be desirable to adjust the variables for economies of scale, student need, and price differences. The Finance Center of the Consortium for Policy Research in Education (CPRE) is currently developing methodologies for such adjustments. To adjust the fiscal variables for economies-of-scale a regression analysis of expenditures per pupil from all districts in the country would be required. To calculate uniform student need adjustments, a universe district fiscal file would need to be augmented with a commonly defined number of low income (students eligible for Elementary and Secondary Education Act (ESEA) Chapter 1 services or free or reduced-cost lunch), disabled (Public Law (P.L.) 94-142 mandated annual state reports), and LEP children. CPRE is testing the use of a single adjustment across all states, using standard weights of 0.2-0.4 for low-income and 0.2 for disabled children, derived from calculating the average extra costs of providing effective additional services for these students (Kakalik et al. 1981; Moore, Walker, and Holland 1982; Clune 1994). Currently, there are price adjustments for aggregate state data (Barro, 1992a; Nelson, 1991); CPRE and the

Several variables could be identified as fiscal measures of opportunity to learn.

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[1] The McLoone Index is the sum of the expenditures per pupil for each district spending below the median divided by the sum as if each district were spending at the median. Usually each district's expenditure per pupil is also multiplied by the number of pupils, so the McLoone Index indicates the ratio of actual spending on students in districts below the median to spending if all districts were at (or raised to) the median.

Again, research in several areas has shown that teaching strategies affect achievement, including research on effective teaching...

National Center for Education Statistics (NCES) are investigating whether a procedure can be developed to use district-level data to create a rough price adjustment at the regional or individual district level.

Within traditional school finance equity frameworks, one also would determine the relationship between expenditure variables and variables such as local property wealth per pupil and median family income, as measured by some correlation or elasticity statistic (Berne and Stiefel 1984; Odden and Picus 1992). However, since opportunity to learn entails differences in inputs or processes per se, whether or not they are related to levels of other economic factors not directly associated with schooling, these traditional measures of fiscal neutrality would not be strong candidates as potential measures of opportunity to learn. On the other hand, as is discussed later, if measures of property wealth per pupil or some household income variable were available, these statistics could easily be calculated and thus take their place in a listing of fiscal opportunity-to-learn variables.

Educational Process Variables

A list of educational process variables could be endless, since many curriculum- and instruction-related variables potentially might be linked to student achievement. Adhering to the two principles of parsimony and research supporting a connection between the variable and achievement helps to winnow this category to a manageable list of five variable types (Porter 1993a). The first would be time spent on classroom instruction; several research studies have shown various time variables, such as time on task and academic learning time, to be strongly linked to student achievement (Cohen, M. 1983; Denham and Lieberman 1980; Fisher and Berliner 1985). Second, high school course-taking patterns also have been shown to be strongly linked to secondary student achievement (Gamoran 1992; Gamoran and Berends 1987; Lee and Bryk 1988). Third, college entrance requirements—primarily for public colleges and universities, but also the Carnegie unit per se—comprise another group of variables that research has shown to positively affect secondary student achievement; these requirements help determine what courses students take in high school, which then has an impact on their learning (Lee, Bryk, and Smith 1993; Porter, Smithson, and Osthoff 1992).

Several curriculum and instructional variables have been shown to have an impact on student achievement. A fourth variable type would be measures of the enacted curriculum; that is the curriculum actually taught in classrooms. Numerous studies have shown that student achievement is strongly determined by what is actually taught in classrooms (McKnight et al. 1987; Schmidt 1983; Sebring 1987). The fifth variable type would be type of pedagogy and instruction used in classrooms to teach a curriculum. Again, research in several areas has shown that teaching strategies affect achievement, including research on effective teaching (Porter and Brophy 1988; Rosenshine and Stevens 1986), on teaching thinking and problem-solving skills, (Palinscar and Brown 1984; Peterson, Fennema, and Carpenter 1991; Resnick 1987), and on teaching problem solving to low-income students (Bryson and Scardamalia 1991; Carpenter et al. 1989;

Peterson, Fennema, and Carpenter 1991; Palinscar and Klenk 1991; Resnick et al. 1991; Villasenor 1990).[2]

Measures of these variables are not so straightforward, although there are several possibilities. The measure for time variables could comprise the actual number of minutes spent on instruction in academic areas, either total time spent or time spent on each curriculum content area. Another measure of time could be time actually used for instruction in core academic subjects as a percent of time available for instruction. Measures of high school course taking could include the total number of academic courses taken in the 4 years of high school, as well as the number of courses taken in each academic content area, such as the number of courses in mathematics, science, language arts, history and social studies, and foreign language.

Measures of public college and university entrance requirements could be obtained the same way, either as total number of academic units required or number of units required in each specific content area.

Measuring curriculum and pedagogical variables poses a somewhat more complex challenge. Porter (1993a) suggests first differentiating among the core curriculum content areas—mathematics, science, language arts, etc. Then, within each content area, he suggests identifying the major subtopics—in mathematics, for example, number and number relations; measurement; probability; statistics; and algebra. Each of these subtopics, moreover, can have various dimensions—in number relations, for example, sets, whole numbers, ratios, percents, and fractions. Measures of the enacted curriculum then would consist of both the actual minutes per time period (day, week, or semester) spent on each content area, subtopic, or dimension within each subtopic. The measure could also be presented as a percent of daily or weekly instructional time.

Measuring curriculum and pedagogical variables poses a somewhat more complex challenge.

For instructional strategies, the same procedure could be used, first by identifying various types of instructional strategies, lecture, demonstration, recitation or drill, whole-class discussion, group work, cooperative learning, etc. While some instructional strategies could be generic across content areas, some are more specific to content areas, such as laboratory work in science, multistep problem solving in mathematics, and the writing process in language arts. One issue that would have to be decided is whether information on instruction should be gathered on a general basis or embedded within content areas. Porter, Smithson, and Osthoff (1992) chose the latter route, even connecting instructional strategy to dimensions of content subtopics. At the University of Southern California (USC), under CPRE auspices, Priscilla Wohlstetter is investigating how school-based management (SBM) can be used to restructure curriculum and instruction. Her study includes cataloging of instructional practices specific to each content domain.

Porter (1993a) also suggests embedded instructional resources such as computers, textual materials, laboratory materials, etc. Indeed, such measures were included in his study (Porter et al. 1993) and are now being

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[2] Darling-Hammond (1992) and others, such as Lee, Bryk, and Smith (1993), as well as Porter (1991), would argue for collecting variables related to school organization, structure, and culture. Clearly, there is research that shows these factors can and do affect achievement. For the purpose of this paper, however, the emphasis is placed on collecting and measuring curriculum and instruction variables, because these variables are potentially the most powerful factors affecting student achievement and because, while the power of these variables has been documented, there has not yet been a concerted effort, either at the national or the state level, to collect them. Thus, by highlighting these variables to the exclusion of other process variables, this paper hopes to imply the importance of actually allocating resources to create a data base that includes valid and reliable measures of curriculum and instruction actually provided in classrooms. Further, opportunity to learn is conceptualized in this paper as a narrower issue than service delivery standards; by this definition, opportunity to learn does not include measures of school organization such as structure and culture (Porter 1993b).

Teacher preparation and licensing also are evolving through potentially major changes.

collected in the USC-SBM study. These measures could also be cataloged under the rubric of curriculum and instructional practices. In short, several measures of educational processes could represent opportunity to learn, have been collected in various research studies, and have been shown to be positively linked to student achievement.

Teacher Quality Variables

Just a few years ago, teacher variables other than education and experience would have been difficult, if not impossible, to list. And in the immediate future, teacher variables other than these measures might not be readily available. However, since several initiatives related to teacher preparation and certification in the near future will likely produce potentially robust variables of teacher quality, this category of variables should be included on a list of opportunity-to-learn measures. As Darling-Hammond (1993) convincingly argues, student learning—especially achievement in thinking and problem solving—depends on teacher expertise. Put a different way, both the enacted curriculum and the pedagogical practices used to teach it can only be as robust as the professional expertise of the teachers who teach it. Thus, sophisticated measures of what teachers know and what they can do might also become powerful indicators of student opportunity to learn.

In the short term, four developing activities will produce quantitative measures of teacher professional expertise that could be used in an opportunity-to-learn framework. First, in September 1994, the National Board for Professional Teaching Standards (NBPTS) began certifying advanced, expert teachers. Experienced teachers will need to pass a rigorous assessment of their content knowledge, pedagogical expertise, and collegial working skills to be certified. Thus, in the very near future, schools could easily identify the number of NBPTS-certified teachers in the school, or at the secondary level, both at the school and within each department.

Teacher preparation and licensing also are evolving through potentially major changes. One initiative ensures that, over time, all licensed teachers will be trained in a fully accredited program, particularly a program accredited by the National Council for Accreditation of Teacher Education (NCATE), just as with the medical and other professions. The notion is that fully qualified teachers must be trained in universities with accredited programs (Wise and Leibbrand 1993). In the next few years, nearly all programs that seek accreditation will have been reviewed according to the new and upgraded NCATE standards. Thus, another measure of teacher quality could be the number and percent of teachers trained in an NCATE-accredited program, on a total school or content area basis.

Third, many states are developing structures to license teachers not on the basis of their taking an approved program of courses at a college or university, but on what they actually know and teach. As these programs become operational, states will produce information on beginning teachers, indicating their expertise in content areas and across several instructional practices. Although each state might develop its own mechanism for gathering these data, the Educational Testing Service (ETS) is developing the PRAXIS system to measure the same competencies. The latter could provide a nationally comparable set of measures, but since opportunity to learn is likely to be more of an interstate issue for the next few years, a set of PRAXIS measures tailored to a specific state or state set of measures could provide detailed information on beginning-teacher knowledge and expertise.

If such information is provided on a pass/fail basis, it might not provide data useful for an opportunity-to-learn assessment. If, however, scaled measures of beginning teacher content mastery and instructional expertise are taken (such as those provided by the ETS National Teacher Examination (NTE)), a list of the number or percent of beginning teachers at or above a given score could provide indicators of beginning teacher expertise. It would also be possible to form some combination of beginning teacher and board-certified teacher measures of teacher expertise in schools.

Fourth, even before the above variables become available, it might be possible to gather more sophisticated measures of teacher expertise than just education and experience. Monk, for example, has shown that the number of courses individual teachers have taken in mathematics and science content and methodology, as well as the total number of courses all faculty in a department have taken, can affect student achievement in those subject areas (Monk, forthcoming). Thus, simple counts of the numbers of courses taken in content areas and subject-specific pedagogy could provide more detailed information on teacher expertise than do current measures of unidentified educational units.

Costs of Collecting Opportunity-to-Learn Variables

As might be expected from the above discussion, not all of the suggested opportunity-to-learn variables could be collected immediately. These variables, however, could be available in the near future at modest cost. This section provides approximate cost estimates for most of the variables identified in the previous section.

Costs of Collecting Fiscal Variables

Because of the major changes NCES has made in the collection of school district fiscal data, the additional costs of collecting fiscal variables of opportunity to learn would be minimal. Indeed, this year NCES provided fiscal data on CD-ROM for every school district in the country, (the F-33 data system, together with the Common Core of Data (CCD) on pupils, staff, and schools.) In the future, NCES plans to collect such data every 5 years as part of the Census of Governments surveys, and perhaps at an additional time corresponding with the decennial census. These data include revenues by source, as well as expenditures by several functional categories. The manner in which expenditure data are provided allows for analysis of the fiscal opportunity-to-learn variables suggested above: current operating expenditures, core instructional expenditure, and instructional expenditures.

In 1992, NCES began to provide more detail for both the revenue and expenditure data, including revenues for different categories of state and federal aid (equalization aid versus categorical aid, such as compensatory, disabled, bilingual, and transportation), and more detailed expenditure categories, such as transportation expenditures and expenditures by program. This allows for even more finely tuned revenue or expenditure variables. But the detail already provided allows for straightforward calculation of all fiscal variables and equity statistics discussed in the previous section. Indeed, the CD-ROM data base has built-in programming to calculate some of the equity statistics and allows for easy transformation of data into standard statistical files from which all other equity statistics could be calculated. It would be very possible in the future to expand the program to include such equity statistics as coefficient of variation, the federal range ratio, and the McLoone index. With the current CD-ROM file, however, the appropriate equity statistics could be calculated at low cost, $50,000 to $100,000 per year. Although one consultant already has calculated several equity statistics for each state from the raw data in the current file, with hardly any external support (Toenges 1993), the data need substantial work to provide a file for analysis: eliminating

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...recent research suggests that district fiscal equity does not necessarily produce school-level fiscal equity.

special districts, occasionally adjusting student counts, and clean-up tasks associated with working with large data sets.

Three advances in fiscal equity statistics would require modest additional resources. First, some additional developmental work might be required for economies of scale, pupil need, and price adjustments. The CPRE Finance Center is confident of developing straightforward adjustments for the former two resources. As data from the 1990 census mapped by school districts become available, counts of at-risk, limited-language, disabled, and poverty students will be obtainable, allowing for pupil-need adjustments. In the medium term, however, actual Chapter 1-eligible, disabled (P.L. 94-142), and LEP counts would be preferred for making vertical equity adjustments. NCES has already sponsored research to develop district-by-district or regional price adjustments. Walter McMahon is developing cost-of-living adjustments, and Jay Chambers is developing wage adjustments; both will allow corrections to be made for the varying purchasing power of the education dollar. The price adjustments that can be developed are possible only because the census data have been mapped within school district boundaries—one more reason to underscore the need for this NCES-sponsored activity once each decade.

Second, the current F-33 file does not include a measure of property wealth for each district nor a measure of household income—variables required for calculation of any fiscal neutrality statistics. Since property tax administration varies across and within states, gathering either intra- or interstate comparable property valuation data on an annual basis poses something of a challenge. Nevertheless, it would be possible to compile, and quite easily, through the same procedure with which the F-33 data are now collected, the measures of fiscal capacity used in the states' equalization formulas. While not fully comparable across school districts in all states, such data would allow a rough calculation of intrastate fiscal neutrality statistics. Further, median family income (and numerous other variables) from the 1990 census soon will be available for each school district to use for fiscal neutrality equity calculations. But since the census is conducted only once every 10 years, another strategy would be needed to provide household income data for each district annually or biennially.

Third, recent research suggests that district fiscal equity does not necessarily produce school-level fiscal equity (Hertert 1993). Thus, for the long term, it would be desirable to have fiscal variables available on a school basis. This more detailed type of fiscal data, however, would require substantially more resources, not only in federal data collection, but also in redesigning state fiscal accounting structures. While the issue would technically entail adding a school code to the current revenue and expenditure accounting system—a code now included in many state/district systems—few states currently collect school-level data, and several technical issues would need to be resolved to collect valid, reliable, and comparable fiscal data at the school level. The long-term goal for both education fiscal data in general and for opportunity-to-learn fiscal data in particular should be to collect data on both a school and district basis.

NCES would be wise to put the issue of collecting school-level fiscal data on a fast-track feasibility study agenda. The need for these data is rapidly rising to the forefront, given the policy attention focused on and actual policy funding of schools (as contrasted with districts). It would be ironic for NCES to have finally produced detailed and accessible district-level data just at the time when the demand and need for school-level data took center stage.

Costs of Collecting Educational Process Variables of Opportunity to Learn

This section discusses the feasibility and costs of collecting information on educational processes on national, state, and district levels. The goal would be to collect the information on a universe district level to match it with the fiscal data; a longer-term goal would be to collect the data at the universe school level. This section suggests using current national data collection efforts, such as those used in the National Assessment of Educational Progress (NAEP) and the Schools and Staffing Survey (SASS), to collect educational process data for national and state comparisons, and using annual state survey collection efforts involving all teachers to collect data on these variables at the district and school levels.

Data on Time, Courses, and College Requirements

The NCES SASS survey, administered every 2 years, asks a series of questions of elementary teachers on the percentage of time allocated to instruction in core content areas and asks secondary teachers questions about the content classes they teach. With only modest adjustment in the questions asked, changes that could be included in modifications of the survey instrument between administrations and the particular questions on time or courses taught (see the discussion above) could be included in this established instrument. The results would allow a portrayal of time allocated to instruction in elementary school core courses and courses offered in secondary schools on a national basis. The SASS survey currently collects percents of time spent on general elementary and special education and other topics at the elementary level, and on courses taught in mathematics, science, english, and social studies, as well as other subjects at the secondary level. Since the SASS sample can be arranged by various categories of variables, such as region of the country and district or school size, a portrayal of this dimension of opportunity to learn by these subnational categories is possible. Further, the current SASS sample of 65,000 teachers provides valid data for each of the 50 states as well, which allows for interstate comparisons.

Expanding SASS to a size that would provide valid data for each district in the country, as was done for federal fiscal data collection, might be possible in the far future but is probably not realistic for any intermediate future. Many states today, however, administer an annual survey of teachers, by which they collect data on various characteristics of teachers, such as education units and years of experience, courses taught, and numbers of students in each course. While teachers generally are not paid extra to complete this survey, a common practice is to dismiss them for half a day to do so. Since completion of the survey takes less than half a day, the teacher benefits by having a few extra free hours. The cost to the system is half a day of release time, but this cost tends to be built into teacher contracts. Thus, states could consider expanding teacher questionnaires with a survey on curriculum and instructional practices; the price could remain the half-day release time. The curriculum survey would simply require more teacher time to complete. Compiling the results into a usable data file would require more resources, but the actual cost of having the teacher provide the data might only be the duplication and physical collection costs for the new curriculum surveys.

State teacher questionnaire data could easily be aggregated to indicate the nature of courses offered in a school and the number of students taking such courses. If desired, the survey could be modified to include information on instruction time spent by using the questions on the current SASS questionnaire. The instrument could also include questions, such as those used in the Longitudinal Study of American Youth, on content courses taken.

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...a rich picture of student achievement and opportunity to learn could be created.

The results could be aggregated to both the school and district levels to show the percent of time spent on instruction in core academic subjects in elementary schools, what content courses are actually provided in secondary schools, and the numbers of content courses taken by teachers in elementary and secondary schools. If student achievement data at the school level were also available from other state sources, which is increasingly the case, analysis could be made of the interactions among the different categories of fiscal, educational process, teacher-related, and student achievement measures, and a rich picture of student achievement and opportunity to learn could be created.

Most public college and university entrance requirements are readily available at the state level and could easily be entered into a 50-state data base.

Data on the Enacted Curriculum and Related Instruction

Just a few years ago, collecting measures of enacted curriculum and related instruction might have been viewed as impossible. Conceptualizing the types of data needed for such an exercise was a major challenge. The assumption was that such measures would have to be collected via direct observation of classrooms or through extensive teacher-generated logs of classroom behavior. But in the past few years, several research efforts have shown that reliable data on the enacted curriculum can be collected through questionnaires (see Guiton and Burstein 1993 for a brief discussion of technical issues that must be addressed in collecting measures of educational processes and practices).

Porter (1993a) and Porter et al. (1993) studied the content of new courses offered in the 1980s in response to new state requirements that students take additional mathematics and science courses. They collected data on the enacted curriculum and related instructional practices, as well as on curriculum-embedded resources, using three methods: direct observations of teachers, extensive teacher logs, and questionnaires. They concluded that, while observations provided the most robust indicators of these variables, the questionnaire data correlated surprisingly high with both the observation and the log data and provided sound indicators of the enacted curriculum. While reliability among the various means of data collection varied by content area, subtopic, and dimension within each content area, the research team nevertheless concluded that measures of the enacted curriculum and related pedagogy could be collected with a sufficient degree of confidence through the use of teacher questionnaires.[3]

Guiton and Burstein (1993) came to a similar conclusion about the potential use of surveys to collect data on curriculum and instructional practices based on their analysis of data from international assessments of student achievement. In developmental work, they found high degrees of agreement between survey data and more detailed information collected directly from classroom practice (Burstein et al. 1991; Guiton 1992). Their conclusions were somewhat more cautious than Porter's, but they suggested that collecting enacted-curriculum data via teacher questionnaires —especially when the information is divorced from any individual accountability—offered promising potential.

This paper assumes that relatively valid and reliable data on curriculum and instruction can be collected through detailed teacher questionnaires. The issue then becomes one of determining strategy for and costs of such data collection. Several potential strategies are outlined below in order of their cost.

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[3] Porter (1993a) asserts that questionnaires work reliably well under the condition that the information be used only for analytic accountability purposes. No study has yet validated the use of surveys in a context in which teachers would be held accountable for the enacted curriculum as indicated by the survey results.

The first strategy would be to revise similar data now being collected in the NAEP program. As part of each NAEP survey, teachers are asked a series of questions about the curriculum content they teach and their related instructional practices. These questions could be replaced with questions developed by Guiton, Burstein, and Porter, and from other more focused work on collecting curriculum and instruction information. For example, the questionnaires developed for use in the USC-SBM study are based on instruments created by Porter et al. and are quite similar in size to the current NAEP questionnaire. The additional cost of such an approach could be minimal, but there would be some additional developmental costs. Depending on the size of the questionnaire, the additional costs for actual collection could be zero if the new questions merely replaced current NAEP questions. This paper assumes a simple replacement of new questions for old questions, with a negligible net cost increase.

The state NAEP assessment sampling procedure could be used to produce valid information for each state. When NAEP administers an assessment to produce comparable data for each state, the sample size is increased (a different amount for each state, depending on the size of its student population). This requires increasing the number of teachers that must complete questionnaires. Again, if current NAEP questions on curriculum and instruction were simply replaced with new questions, the costs of gathering data comparable for each state would be negligible.

Use of NAEP might not be the appropriate strategy for collecting curriculum and instruction data if the more detailed information described in the Porter et al. (1993) study is desired. Since the major purpose of NAEP is to collect student achievement data, adding a lengthy and extensive survey on detailed curriculum and instructional practices could overload the NAEP program.

A more feasible way to collect national data on curriculum and instruction practices would be to expand the NCES-administered SASS. This nationally representative sample of teachers provides information that can be arranged by several factors, including state characteristics. It is, therefore, a data collection mechanism that could be used to collect detailed national data on the curriculum and instruction actually delivered in classrooms (by content area, subtopic within content, dimension within subtopic, related pedagogy, and curriculum-embedded resources).

There could be several strategies for using the SASS teacher questionnaire to collect detailed curriculum and instruction data. One strategy would be to simply expand the current SASS teacher questionnaire. But this questionnaire requires 45 minutes to an hour to complete, and expanding it would nearly double the time, since the more detailed enacted curriculum questions also require 45 minutes to an hour to complete. In addition, while expansion is technically possible, more data collection resources would be required to keep the response rate at the current 85 percent or higher; indeed, a large portion of current cost is follow-through work to get the current teacher-questionnaire response rate up to 85 percent.

It is difficult to predict how much more effort would be required if the questionnaire were to double in length, but it could require considerable resources. Another strategy would be to take a parallel sample of 65,000 teachers from the same districts and schools as the current SASS sample and ask them to complete only the enacted curriculum materials; this would allow setting of the enacted curriculum data in the appropriate teacher, school, and district contexts. Another strategy could be to ask a smaller

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To get more focused or more comprehensive curriculum and instruction data for each district and school, expansion of current annual state surveys of teachers would be the most likely route.

sample of teachers to collect just the enacted curriculum and instruction data, but it is unclear whether this procedure would save much in the form of collection costs, since the sample would need to provide valid data for each state. Since the current SASS teacher questionnaire requires about $2 million to administer, an upper limit for collecting this type of detailed curriculum and instruction information could be $2 million (for the second strategy), high but perhaps worth the price given the important role such new and rich data could provide.

Of course, the most desirable information would be on curriculum and instruction within state levels, that is the data for each district and school. There would be at least two possible strategies for gathering this type of information: one focused on getting the data on a reliable basis for each district and another for getting the data on a reliable basis for each school. For the former, the information then could be matched with other district-level variables, and an analysis of interactions among fiscal, curriculum, teacher, and achievement variables could be conducted. To provide district-level indicators, a representative sample of teachers could be drawn from each district, and the survey document on curriculum and instruction practices could be administered solely to this sample. Assuming the SASS cost of about $30 per teacher, the cost would vary by state; but the aggregate national cost would be substantially higher than the $2 million required for the current SASS. In other words, this approach would entail a new, separate, and costly data collection effort.

A potentially more powerful and undoubtedly less costly approach would be to combine the elements of a survey of curriculum and instruction practices with the teacher survey many states already administer on a yearly basis. These latter surveys are often used for pension purposes and provide detailed information on teacher load, courses taught, actual class size, and teacher characteristics. For example, a large portion of the information included in the California Basic Education Data System is derived from universe teacher surveys administered annually. Again, many states also collect information from teachers through this type of universe survey. Thus, states could consider expanding these teacher questionnaires with a detailed survey on curriculum and instructional practices, with the price remaining the half-day release time. The curriculum survey would simply require more teacher time (a maximum of 1 hour) to complete.

In short, NAEP teacher questionnaires could be modified to include a more limited set of curriculum and instructional practice data for both national and state comparisons. The cost would be negligible. For more specific and comprehensive curriculum and instructional data, the SASS would need to be enhanced, perhaps even expanded to include valid data for each state. The costs would be greater, perhaps adding $2 million to current SASS costs. To get more focused or more comprehensive curriculum and instruction data for each district and school, expansion of current annual state surveys of teachers would be the most likely route. Costs would be higher for development (data entry) than for collection, since teachers are already relieved of duty for half a day to complete a questionnaire.

Costs of Collecting Teacher Quality Variables

The teacher quality variables identified in the previous section, such as the number of board-certified teachers and scores on teacher licensure examinations, could easily be included on the annual state teacher survey form or the NAEP/SASS questionnaires. Currently, such forms collect information on years of experience and educational units, the current basis for teacher compensation and the current, generally used indicators of teacher quality. Some states even include scores on the NTE when it is required as part of state licensing procedures. However, as national board certification becomes more standard practice, as individuals take results-oriented assessments for licensure instead of just an approved set of university courses, these more robust indicators of teacher expertise could just as well be added to the state, NAEP, and SASS teacher surveys. Further, all surveys could collect information on the number of content-oriented courses teachers take to obtain additional information on teacher preparation.

Such a strategy would entail simply adding a few relatively straightforward questions to the data collection efforts now conducted. The extra costs would be negligible. Moreover, the universal teacher data from the state surveys could be aggregated to the school level, thus allowing creation of professional expertise descriptors on a school-by-school basis and providing an additional set of potentially powerful opportunity-to-learn indicators.

Costs of Implementing Opportunity to Learn

The final step in discussing the costs associated with opportunity to learn is to provide some estimates of the implementation costs. This section of the paper must be tenuous. Since the concept of opportunity to learn has not yet been fully clarified in the literature, trying to cost out what it would take to provide opportunity to learn is a hazardous task. This section does provide some suggestions on how this task might be conceptualized, with the understanding that conclusions and cost figures must be viewed as preliminary at best. With that in mind, this section identifies some potential implementation costs for the four categories of variables: fiscal, educational process, teacher quality, and student performance.

Costs of Implementing Fiscal Opportunity to Learn

Fairly precise cost figures can be calculated for various measures of fiscal opportunity to learn. The dilemma, of course, is that fiscal variables may be the least precise indicators of opportunity to learn. Thus, the specificity of dollar estimates of providing fiscal opportunity to learn should be viewed with caution, as the costs could be much higher or lower if the issue were to accomplish the goal of having all students achieve at high levels.

The dilemma, of course, is that fiscal variables may be the least precise indicators of opportunity to learn.

Several estimated costs can be provided. Toenges (1993) estimated the costs first of raising the expenditure per pupil in each district to equal the expenditure per pupil at the 75th percentile within each state, then of raising it to a $5,000 minimum nationwide (just slightly below the national average expenditure per pupil in 1990–1991). The total cost of reaching the former goal was about $24 billion, an increase of about 11.5 percent relative to the total revenues/sources (local, state, and federal) and an increase of 25 percent in state revenues. The cost of raising each district to a minimum expenditure of $5,000 per pupil was $17.4 billion. Toenges also estimated the cost of accomplishing both goals; that is, increasing each district's expenditure to that of the district at the 75th percentile within a state, then an additional increase to $5,000 if applicable. The cost of this improvement in fiscal opportunity to learn was estimated at $31.1 billion, an increase of about 15 percent over the total revenues of $208 billion in his sample.

The Toenges estimates are all somewhat understated because the data set he used excluded about 20 percent of the districts in seven states, and his sample excluded Hawaii and Washington, DC. Further, he did not adjust the figures for differences in the price of education across states, which would affect the cost of raising all districts to a

...even substantial increases in per-pupil expenditure equity could be accomplished for less than the revenue increase each decade for the past 40 years.

national $5,000 minimum. His cost estimates should be somewhat inflated to indicate costs in 1994 dollars. Nevertheless, he showed that even substantial increases in per-pupil expenditure equity could be accomplished for less than the revenue increase each decade for the past 40 years (Odden 1992).

Using data from the NCES F-33 universe data file for all districts in all states for the 1989–90 fiscal year allows more complete cost estimates for achieving various levels of fiscal opportunity to learn. In a recent CPRE study of potential federal roles in school finance equalization, Hertert, Busch, and Odden and Conley (1994) provided various estimates for reducing the McLoone index to 1.0 and for raising expenditures per pupil across the 50 states to a national average level.

Table 1 provides the projected 1989–90 costs of raising expenditures (grades K–12) per pupil to various median and average levels (in 1990 dollars). The cost of raising the per pupil amount from state and local revenue sources to the median for each state would have been $8.7 billion, an overall increase of 4.2 percent of total operating revenues for education. This would have produced a McLoone index of 1.0 for all states and substantially reduced the coefficient of variation. The cost of raising per-pupil revenues to a regional median would have risen to $13.6 billion or 6.5 percent of total operating revenues.

The last two rows of data in the table show the equalization issue from a more national perspective for which the McLoone index is 0.81 and the coefficient of variation is 0.33, considering all districts in the country without regard for state boundaries. The cost of raising each district to the national median in 1989–1990 would have been $17 billion—an 8.1 percent increase; this would have produced a McLoone index of 1.0. The cost would have risen to $23 billion for raising each district to the national average; this also would have produced a McLoone index of 1.0 and would have reduced the coefficient of variation to 0.22, still far above the 0.10 standard for equity (Odden and Picus 1992).[4]

Although the overall costs of these equity advances are in the billions of dollars, they are relatively modest when considered as a percent of total operating school revenues. They are well within the range of revenue increases provided to schools on a periodic basis, which for the three decades from 1960 to 1990 averaged just over 2 percent per year in real terms (Odden, forthcoming).

Costs of Implementing Curriculum-Related Opportunity to Learn

The methodology for estimating the costs of meeting the various curriculum-based definitions of opportunity to learn is unclear. Increasing the percent of time spent on instruction in core content areas in elementary schools or increasing the number of academic courses offered in secondary schools could be viewed as add-on costs or simply as replacement of current time, or courses with time or courses focused on core academic subjects.

The argument for the latter approach is threefold. First, research in elementary schools shows that only a small portion of time is spent on instruction in academic content areas (Karweit 1989) but that with a clear focus on academic learning and training in effective teaching and classroom management, substantially more time within the current school day could be used for aca-

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[4] Technically, the goal should be to increase funding in a way that brings the equity statistics of the federal range ratio, coefficient of variation, or McLoone index within some normative target. Bringing all districts up to the median would produce a McLoone index of 1.0, indicating perfect equity. Bringing expenditures up to either the median of some average expenditure level would likely also reduce the coefficient of variation; the goal would be to reduce that statistic to below 0.10, an equity standard some have suggested for the coefficient of variation (Odden and Picus 1992).

Table 1.— Projected costs of raising public K-12 expenditures per pupil to various levels in the United States, 1989–90 (in 1990 dollars)

Level of expenditure	Cost (in billions)	Percent increase
State median	$ 8.7 billion	4.2
Regional median	$13.6 billion	6.5
National median	$17.0 billion	8.1
National average	$23.0 billion	11.0

SOURCE: Hertert, Busch, and Odden (1994), with additional calculations from the same data base.

demic instruction (Fisher and Berliner 1985). Second, a result of the early 1980s education reforms was replacement of watered-down courses with those offering more academic content (Porter, forthcoming). Third, a major reform in vocational education, which in the past provided a very different curriculum in academic content, is to use vocational courses to teach the higher level academics required in the core curriculum (Raizen 1989); thus, vocational education becomes an alternative route for teaching content at a high standard, rather than a separate and less rigorous curriculum.

All three examples suggest that improvements in the enacted curriculum can be made without increasing class time by using teachers and classes more effectively, at no increase in operational costs. However, since there is not yet wide agreement on what a national core set of high curriculum standards would be, it is not possible to conclude that providing full opportunity to learn under such curriculum standards can be accomplished by simply using current time and courses differently. It is possible to conclude that substantial progress could be made toward this goal by using current time and courses more effectively.

. . .improvements in the enacted curriculum can be made without increasing class time by using teachers and classes more effectively, at no increase in operational costs.

There is ample evidence that both restructured preservice and substantial inservice teacher training will be required to enable all to teach a new, thinking-oriented curriculum; that is, to provide the 1990s curriculum version of opportunity to learn.[5] Research on the implementation of the California curriculum frameworks suggests that while teachers are willing to work hard to change their classroom curriculum and instructional practices, more professional development is needed to accomplish a complete transformation of the school curriculum (Cohen and Peterson 1990; Marsh and Odden 1991). Further, Little (1993) argues that the professional development required for accomplishing current education reforms that include completely restructuring curriculum and instruction should be more substantial, more intense, and longer lasting than what typically has been provided in the past.

Putting a price tag on such robust professional development is not easy. In the corporate sector, however, organizations engaging in successful restructuring—similar in intensity to what is needed in education—often spend 2 to 4 percent of their budget on ongoing training. There are no comparable figures for education. One study of statewide expenditures for professional development in education concluded that slightly less than 1 percent of total expenditures were for all types of training (Little et al. 1987). For purposes of (rough) calculation, let us also assume that this figure can be generalized to the nation. Let us also assume that the corporate-sector figure for needed costs of ongoing training can apply to education. Thus, the professional development needed to implement a thinking-oriented curriculum in all schools and thus provide full-curriculum-related opportunity to learn would require 2 to 4 percent of school expenditures, less the approximately 1 percent already spent (assuming such funds could be reallocated for these new curriculum and instructional purposes). Using the $300 billion being spent for public elementary and secondary schools in 1993–1994 as a base, professional development costs would total $6 to $12 billion, less $3 billion now spent, or between $3 and $9 billion more.

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[5] Because of limited space and data, this paper does not discuss the costs of changes in teacher preparation, nor does it discuss possible changes in instructional materials costs.

> ...the professional development needed to implement a thinking-oriented curriculum in all schools and thus provide full-curriculum-related opportunity to learn would require 2 to 4 percent of school expenditures,...

In short, providing the opportunity for all students to be exposed to a thinking-oriented core curriculum, such as that being implemented in California, would cost about $3 billion to $9 billion more in ongoing professional development. This amount is considerably less than that required to provide fiscal opportunity to learn.

If fiscal opportunity to learn were not provided, it clearly should be possible to include the above professional development costs in education system budgets over a short period, since they represent an increase of only 1 to 3 percent and a refocusing of current professional development funds. If fiscal opportunity to learn were provided, moreover, the above curriculum-related opportunity-to-learn costs could be subsumed under those of implementing fiscal opportunity to learn, with the simple requirement that the first 3 percent real increase in educational revenues be spent for ongoing professional development.

Costs of Implementing Teacher-Related Opportunity to Learn

Teacher-related opportunity to learn overlaps considerably with curriculum-related opportunity to learn. Apart from training new teachers, the issue would center on the cost of producing teachers who could be certified by the NBPTS, and of increasing the number of curriculum relevant content courses that teachers would be motivated to take.

For the former, there is no obvious methodology for determining cost, since NBPTS certification is yet to begin and there is no empirical data base from which to estimate costs. A reasonable argument would be that preparation for NBPTS certification could entail the same process as preparation for teaching under the new curriculum standards, since both are targeted on similar evolving national curriculum content standards. Under this argument, the costs would be the same as for ongoing professional development, or between $3 billion and $9 billion above current costs for such activities. This argument would also mean that two definitions of opportunity to learn could be realized simultaneously: preparation of teachers to teach a thinking-oriented curriculum and to obtain NBPTS certification.[6]

An additional cost could be the price of taking the NTE, now estimated at about $1,500 per teacher. Assuming that 10 percent of the nation's 2.2 million public school teachers would take the test each year, the total cost of taking the examination thus would be $330 million, which potentially could be covered by the funds set aside for ongoing training.

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[6] This argument assumes that through intensive professional development, all teachers in the education system could be trained to teach according to the new curriculum standards, regardless of preservice training. While this assumption might be somewhat optimistic, it is reasonable until empirical evidence emerges to show that it is not.

The cost of taking additional content courses is also very difficult to calculate. Thus, this author will make a suggestion: that districts reimburse teachers for taking courses, rather than reward them a higher salary each year as a result. If this procedure were to mean reimbursing each teacher for taking one course per year at a cost of $500 per course (a rough average for courses offered at both public and private postsecondary institutions), the cost would be $1.1 billion ($500 x 2.2 million teachers). While this is a high price, it is considerably less than what teachers are now paid on an ongoing basis for taking courses that may or may not be related to what they teach. The net cost of this proposal could potentially be lower, since many districts today already pay the expenses of additional higher education courses.

Further, the approach of paying for continuing postsecondary education could also be a mechanism for directly including the higher education system in the ongoing professional development and training of teachers. Since higher education faculty and the education system would be deciding which courses are sufficiently targeted to the professional development needs of teachers and thus would be determining which courses would qualify for reimbursement, the costs could potentially be subsumed within the overall professional development budget of an extra $3 billion to $9 billion. In this way, higher education could remain a central provider of professional development; there would be procedures to determine what courses would count; teachers would be relieved of paying for postsecondary credits; and the costs would be included in the school or district professional development budget.

Finally, this approach of providing substantial ongoing professional development, including paying for approved higher education courses, could be combined with a gradual shift to a knowledge- and skills-based pay system (Odden and Conley 1992; Mohrman, Mohrman and Odden 1993) both as an incentive for, and as a way of, rewarding teachers for developing the expertise needed for this decade's education goals and curriculum standards.

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Concluding Comments

Identifying the costs of measuring and implementing opportunity to learn is difficult, if not impossible, since the definition of opportunity to learn has not yet been solidified. Thus, the points in this paper must be taken as only beginning steps on the trek of more firmly identifying such costs. The author hopes that the structure of this paper contributes to conceptualizing the task of identifying such costs. Perhaps its claims also can be used to urge both federal and state governments to proceed in collecting new types of information, such as data on the enacted curriculum, that could become part of an opportunity-to-learn indicator system. Once only a dream, it now appears that collection of these variables can be accomplished through surveys and questionnaires; given their potentially powerful connection to student achievement, every effort should be made by all governments to provide the education system with this information at the school, district, state, and national levels.

It also appears that the opportunity-to-learn variables identified in this paper could be collected through current data collection efforts with only modest increases in resources, although the costs of collecting enacted curriculum information through the federal teacher questionnaire of the SASS could approach an extra $2 million. But, given the potentially important uses for which this type of information could be used, the cost might well be worth the effort. Interestingly, because of advances already made in fiscal data collection efforts, many of the fiscal opportunity-to-learn variables are already being collected.

While the projected costs of implementing opportunity to learn must be viewed with extreme caution, two conclusions may be drawn. First, the national costs of providing fiscal opportunity to learn would seem to be far less than the amount the nation typically adds to the school system each decade, and although distributing new dollars across districts in a way that would provide fiscal opportunity to learn would require a new political will, the fiscal point is that the overall cost of doing so would be well within traditional bounds. Second, the costs of providing curriculum- and teacher-related opportunity to learn could be subsumed within the costs of providing fiscal opportunity to learn. This suggests, once again, that the ways in which new education dollars are distributed, allocated, and spent—not just the total amount of money—are critical issues.

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